



MACIEJ PAPROCKI

ROADS IN THE DESERTS
OF ROMAN EGYPT

ANALYSIS, ATLAS, COMMENTARY



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Roads in the Deserts of Roman Egypt

Analysis, atlas, commentary

Maciej Paprocki

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(bottom, left) Photo of the saline coastal bog in the desert, copyright Maciej Paprocki.

(bottom, right) Photo of the author looking at the tracks at the sea shore, copyright Maciej Paprocki.

To Jadwiga Sokołowska
And Barbara Wartenberg,
Who dared me to the desert
And showed me the way

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Preface and acknowledgements

Roads in the Deserts of Roman Egypt is a revision of my eponymous doctoral thesis, which I wrote under Prof. Colin Adams' (University of Liverpool) supervision and defended in 2015 in the Department of History at the University of Wrocław, Poland. Its focus is on Egypt under the Romans (30 BCE–early 3rd century CE), a period when local deserts experienced an unprecedented flurry of activity. A rapidly developing field, desert road archaeology has used satellite imaging, landscape studies and network analysis to plot desert trail networks with greater accuracy; however, the coverage of the material has by necessity been patchy, with extant studies on Egyptian desert roads either limiting their focus to one area or indiscriminately including all areas and epochs of ancient Egypt. In contrast, this chronologically-focused study focuses primarily on the road network development in the Roman period. Its primary aims are to compile and reconsider the knowledge amassed so far on desert roads in Roman Egypt and to assess Roman influence on the road density in two select desert areas, one of central importance to the Roman empire (the central and southern section of the Eastern Desert) and one, peripheral (central Marmarican Plateau). This monograph discusses geographical and social factors influencing the road use in the period, demonstrating that Roman overseers of Egypt adapted remarkably well to local desert conditions, improving roads just as their predecessors would have done it. Not all desert areas of Egypt are equally suited for anthropogenic development, but almost all have been optimised under the Romans in one way or another, with road installations built for added comfort and safety of travellers. Accordingly, this study of how Romans successfully adapted to desert travel will be of interest to all those who study deserts and their ongoing expansion due to the global warming – not only to scholars of desert transport and road archaeology, but also to non-specialist readers interested in desert travel and exploration. To that end, the volume has been supplemented with several maps of desert road networks in Roman Egypt, every map accompanied by a commentary and list of secondary sources.

This book would have never been written without the support of many people and organisations. My doctoral research project, a part of 'The Eastern Mediterranean from the 4th century B.C. until late Antiquity' programme, was funded thanks to generous support from the Foundation for Polish Science. This scheme, realised within the International Ph.D. Projects programme, was co-financed from the European Union, Regional Development Fund within the frameworks of Measure 1.2 'Strengthening the Human Potential within the Science Sector' of the Operational Programme Innovative Economy.

On a personal level, I would like to acknowledge my academic advisors, Professor Andrzej Łoś and Dr Colin Adams, who endeavoured to guide me through the labyrinth of the desert, supervised the writing process and rectified my mistakes; those which remain are my sole responsibility. I am also indebted to Professor Krzysztof Nawotka and my cohort of doctoral colleagues, who taught me valuable lessons in assertiveness, honesty, and personal integrity.

As I corrected my dissertation for publication, I have greatly enjoyed interactions with my friends and colleagues in the academia and beyond. During my postdoctoral fellowship in Munich (2015–2018), I frequently drew inspiration and received feedback from many mentors and colleagues, especially Prof. Susanne Gödde, Virginia Fabrizi, Joseph Sanzo, Bernardo Ballesteros Petrella, Henry Albery, Constanze Graml, Ralph Birk, Alma Brodersen, Elisa Roßberger, James Hamrick, Aaltje Hidding, and Ulrike Berndt. Special thanks also go to those who supported my research activities in Munich, in particular Prof. Martin Hose and Anna Waldschütz.

My dear friends, co-organisers of Annual Student Conferences in Classical Civilization (Studencka Konferencja Starożytnicza), periodically provided me with much needed respite from my project, made me laugh and gave me perspective. Special thanks go to Maria Gierszewska, Katarzyna Kuszewska and Elżbieta Saks for their unfailing support, to Filip Taterka, a great friend who helped me in a very difficult moment, and to Paulina Dziedzic and Małgorzata Marczak, who have always been kindness itself to me. I also wish to thank my dear friend Szymon, who shared my daily struggles: his BA thesis and my dissertation were written side-by-side. I cannot find words to express my gratitude to my dearest friends, Damian Przybyłowski and Małgorzata Bieszczanin, whose friendship truly knows no bounds.

This book is dedicated to two of my school teachers, Mrs Jadwiga Sokołowska (geography) and Mrs Barbara Wantenberg (biology). Their thorough and engaging lessons sparked my imagination and taught me perseverance and diligence, both extremely necessary when one intends to study the desert. Significantly, it was them who first taught me why camels store fat in humps and what the difference is between *erg*, *serir* and *hamada* – without their influence, in all probability I would have never embarked upon such a venture.

Last, but certainly not least, I would like to express my warmest thanks to my family: mother, father, brothers, and sister, who were always there for me. Whatever I have achieved, it was thanks to your help and loving kindness.

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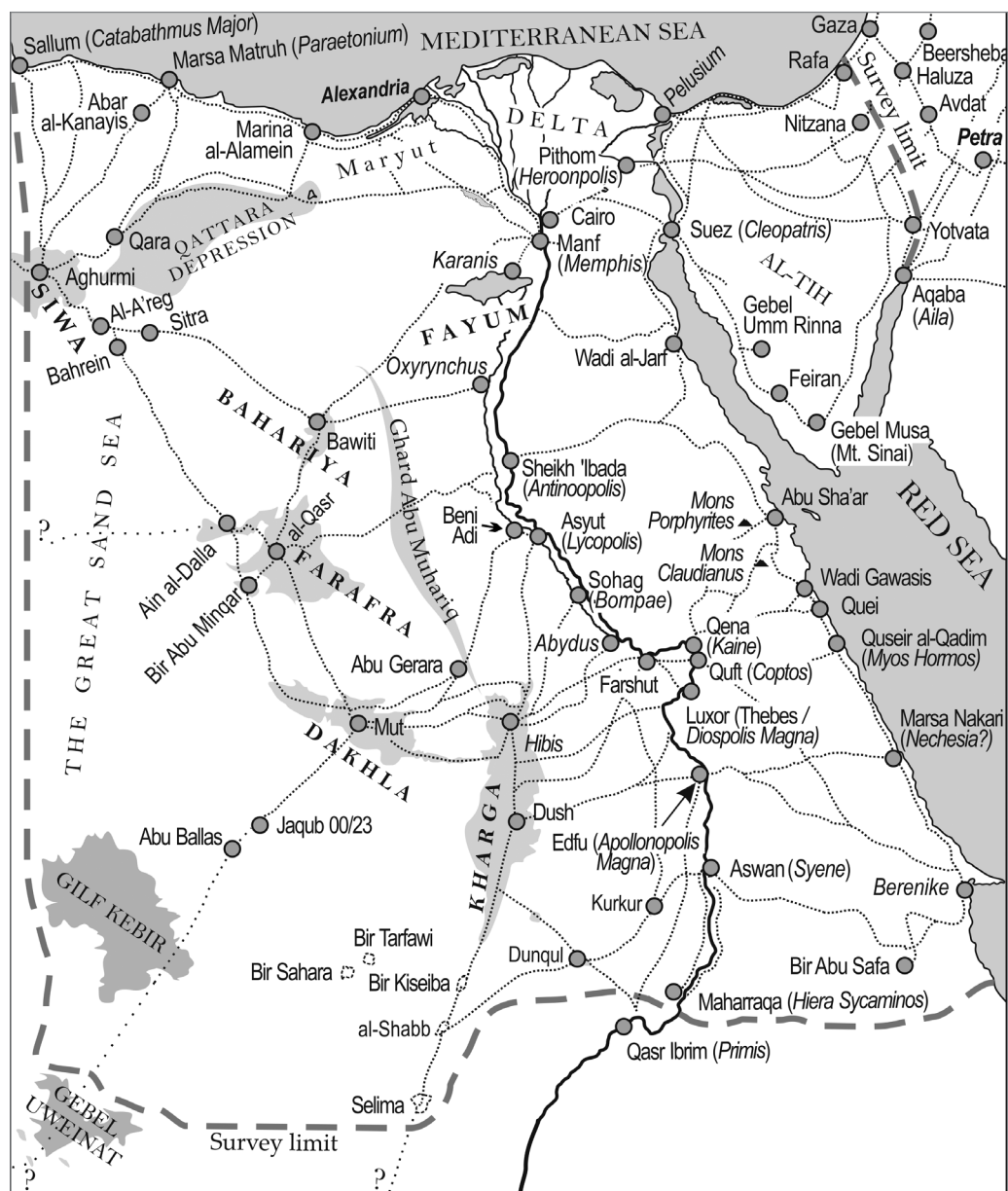


Fig. 1.1 Map 1 - Desert roads of Roman Egypt

1

Introduction: research aims, book structure, and sources

1.1. Main research aims and scope

What makes the desert beautiful is that somewhere it hides a well.

ANTOINE DE SAINT-EXUPÉRY, *The Little Prince*

Herodotus famously remarked that Egypt is the gift of the Nile.¹ However, contrary to the commonly held opinion, there was more to Egypt than the Nile Valley. The deserts that surround the Nile Valley from the east and west are not Egypt's absolute boundary but a permeable membrane through which many roads run to link Egypt to adjacent lands. The sandy expanses of the Western and Eastern Deserts, not unlike a sea, separate Egypt from and simultaneously link it to its neighbours. The Western Desert buffers Egypt from Libya in the west and lands of modern Chad in the southwest, whereas the Eastern Desert stands between Egypt and the Red Sea and Arabia in the east, and Near East and Mesopotamia in the northeast. Two deserts come together in the southernmost part of Egypt, where they shield Egypt from Nubia and Sudan. From the very beginning, the Egyptians have braved these deserts to trade with foreign lands, leapfrogged from oasis to oasis, followed the dry river beds (*wadis*) and conspicuous landscape features across the inhospitable terrain. Many of the trodden trails were furnished with road infrastructure: watering stations with pottery and fodder caches, road markers, stelae, shelters, and ramps.

When Egypt first came under the Roman power in 30 BCE, the Romans who were charged with overseeing the country inherited its elaborate desert road infrastructure and trade networks and, over time, they improved and extended them. Across the Eastern Desert, caravans walked from the Nile Valley to Red Sea ports and back, carrying Indian and African goods into imperial borders. Other expeditions went to remote Eastern Desert quarries to satisfy Roman appetites for expensive building and

carving material: imperial porphyry, diorite, gabbro, and granodiorite. Military and watering posts were erected to control population movements in this vital region and protect imperial goods from looting by desert raiders. In the Western Desert, many new agricultural communities mushroomed around the oases: in time, traffic on desert roads between oases and the Valley swelled to accommodate increased population. These developments in desert travel in Egypt under the Roman administration are the main subject of this book.

As the subtitle suggests, this book is simultaneously an analysis, an atlas, and a commentary regarding the desert roads in Roman Egypt. Compiling and reassessing our state-of-art knowledge concerning the desert roads in Roman Egypt, I have set up a system for analysing desert trails, I present the material within the context of this system, and I discuss how road networks come together. For the analysis section, I have assessed the Roman influence on the road density in two select desert areas, Marmarica and the central and southern section of the Eastern Desert. As I have mentioned, some areas of Egypt experienced a surge of traffic in the Roman period: it is one of the aims of this book to gauge and assess that change. This book is also an atlas: to elucidate how roads come together into systems, I exemplify my points with desert road maps interspersed throughout this volume. Finally, this book is a commentary: I have carefully read the available sources on specific desert trails, weighed the evidence for and against Roman activity for a given road connection and provided references and cues which cannot be gleaned from sources alone.

The geographical scope of the project encompasses an area that roughly equals the area of modern Egypt, the area covered depicted on Map 1. Among the regions analysed, one can enumerate all major oases of Egypt (Siwa, Bahariya, Farafra, Dakhla and Kharga), and some of the minor ones (Al-A'reg oasis group, the so-called Nubian oases). The analysis also includes the sea-facing regions: the Sinai Peninsula wedged between Suez and Aqaba Gulfs, the Mediterranean coastal strip from Gaza to Pelusium and from Alexandria to Sallum, and the Red Sea coast down to Medinet al-Haras (Berenike). Finally, it encompasses the entire Eastern Desert as far south as Maharraqa (Hiera Sycaminos), and the hinterland of the area known as Dodecaschoenus, the ancient boundary zone between Egypt and Meroe. Importantly, I would like to note that the shifting borders of the Roman province of Egypt do not entirely tally with the borders of this survey. I decided to include the lands adjacent to Egypt as a buffer zone, to demonstrate that desert trade networks were not – and still are not – limited by national or administrative borders, but they link all places where water, food, shelter, and trading opportunities are to be found, with no regard for political divisions.

The analysed timespan is the period when the Romans ruled Egypt; specifically, I focus on the epoch between 30 BCE and late 2nd/early 3rd century CE – roughly equal to the Early Roman/Early Imperial (or simply Roman) era, with accessory material coming from the Ptolemaic/Hellenistic period (3rd century BCE–30 BCE) and the Late Antiquity/Late Roman/Coptic/Byzantine period (4th–6th century CE).² The desert, perhaps more than any archaeological environment, resists change and

decay: on a desert trail, one may find a Stone Age tool by a plastic water bottle. This peculiarity also holds for desert trails themselves: unless local conditions drastically change, desert roads follow well-worn travel corridors, linking one point of interest to another through the barren landscape. Ostensible permanence of desert trade networks, however, may and does blind us to periods when trails change, when shifts in natural and human-dependent factors enforce corresponding shifts in travel patterns. The period analysed in this book correlated with such shifts. Camels were becoming more popular in desert trading, drastically cutting down travel time and effort. New destinations appeared: quarries and mines of valuable resources, Red Sea ports with their exotic wares, farming communities across the Western Desert. The previous scholarship on desert trade in Egypt has not always taken proper care to register these developments and their influence on road networks: it is one aim of this book to address this problem.

My research focuses on roads that were used regularly and at least demonstrate signs of being occasionally walked on during the Roman period. The physical remains of the road constitute the most significant part of relevant evidence: the road itself, its installations, wells, fortlets, and road-stations. Understandably, roads of Egypt are often little less than poorly preserved trails. However, I would like to avoid the pitfalls of the connect-the-dots approach popular in some circles. A pervasive scholarly belief holds, if a papyrus records a caravan's departure at point A and then a later arrival in point B, then this is evidence of a road existing between these two points, and we can analyse it as if it were a tangible entity. This manner of thinking is particularly prevalent in works based mostly on papyrological evidence. I believe this line of reasoning cannot be defended, as we do not know which track the caravan used, whether it had any major stops on the way, and if there were any detours. Furthermore, a single caravan is silent in the desert landscape because it usually does not leave physical traces visible to us. In contrast, in this book I look for places where the steady flow of desert traffic left distinct traces over the millennia and we can say with certainty these roads were frequented by ancient travellers. I understand it is difficult to take one desert road and neatly separate the Roman layer from what essentially is a palimpsest of the local desert transport activity, but I strongly believe it is better to try and fail than to pretend we tracked a desert road, when all we truly know is where a trail started and ended.

Certain issues are beyond the scope of this survey. Significantly, I do not include minor roads – for instance, those that linked the Valley to the nearby quarries. I acknowledge that these roads also belong to the system of connectedness that binds all desert sites; however, they usually function simply as extensions of the river transport system and thus they have been omitted from my analysis. Moreover, this book contains no section that would deal with the history of research on the topic. Desert road archaeology, a field of study only recently reconceptualised as a separate discipline, has traditionally drawn data from many disparate bodies of scholarly knowledge. In this work, I follow this tradition: previous surveys and works of my

predecessors are introduced on a need-to-know basis as I discuss every important trail of the Western and Eastern Desert. Certain readers may find the book lacking because it does not go into detail on generalities and particulars of desert road infrastructure and trade under the Romans. To not discuss these issues was my conscious decision: faced with an extraordinary wealth of previously uncompiled material on desert roads of Egypt, I decided to let the sources speak for themselves. Furthermore, I deemed it more important to present desert roads in all their complexity, to comment upon their turns and itineraries, rather than to engage at length in more general discussion about the nature of trade networks, connectivity, and landscape archaeology. Nevertheless, I hope that specialists interested in the latter fields will still draw interesting data from the material compiled in this volume. Wherever it has been possible, I have indicated white spots and uncertainties as opportunities for further study and advancement of the field. All remaining mistakes and inconsistencies are my sole responsibility.

1.2. Structure of this book

The structure of this book is as follows. Chapter one entails a general introduction to the topic. Within this chapter, I present research aims, define the scope of this research piece, and consider types of sources available to those researching desert roads of Roman Egypt, such as textual, archaeological, and cartographical sources. In chapter two, I investigate road networks of Roman Egypt. I discuss factors influencing road network density and capacity in a given area (terrain topography, geology, hydrology, human communities), briefly considering theoretical underpinnings of the road network analysis, and explain how I will ascertain why the road network density increased in selected areas under the Romans. Subsequently, in chapter three I appraise the role of pack animals in the desert transport under the Romans, showcasing why the adoption of camel as the beast of burden changed the nature of desert travel in Egypt.

In the central part of this book, I list all known trails of the Eastern and Western Desert that probably have been walked in the Roman period, commenting upon their antiquity, importance and role they played in road networks. Chapter four discusses roads of the Sinai Peninsula, whereas chapter five examines trails of northern, central, and southern sectors of the Eastern Desert. In chapter six, which focuses on the Western Desert, I adopt a more functional approach, with less emphasis on geographical contiguity and more on functional ties between the regions. Two initial subsections deal with roads that connected two major communities (Alexandria and Memphis) to select sites in the Western Desert. Afterwards, I discuss road links between the isolated region of Siwa and the Mediterranean coast; succeeding subsections examine desert trails between the Valley and the oases, such as Bahariya, Farafra, Dakhla, and Kharga. Some attention is devoted to short roads crossing the Qena Nile Bend and the longer ones criss-crossing the hinterland of Dodecaschoenus at the southern limits of Roman Egypt. In the final section of chapter six, I briefly discuss desert roads that do not lead to the Nile or to the coast (such as roads between

major oases), also noting rarely used roads from major oases to sites beyond Egypt, such as Libya or northern Sudan.

Chapter seven constitutes a case study on road density in two areas of the Egyptian desert. Using methodology established in the second chapter, I analyse selected areas and answer which factors increase road density and whether Roman presence in Egypt made any difference. Lastly, chapter eight contains my conclusions and directions for future research. The book ends with the references section and an index of place names and concepts found within its text.

1.3. This book as an atlas: maps of desert trails of Roman Egypt

1.3.1. Desert roads of ancient Egypt – previous attempts at mapmaking

In direct contrast to more popular literary, epigraphical, and archaeological approaches, few studies have been primarily devoted to charting desert roads of ancient Egypt, although almost all serious works on them have featured a more or less precise desert map. Despite their great potential, charts of ancient desert roads drawn by authorities are often unreliable. First, desert road maps frequently feature what I call non-existent ‘fantasy roads’; driven by *horror vacui*, cartographers were compelled to draw straight dotted lines in the vast, uncharted stretches of the desert to connect the dots, even if there was little evidence for the existence of such trails.³ Second, desert surveyors often have no means of ascertaining whether a particular road was travelled in the Roman period. In a desert environment, where a plastic bottle might lie by a Stone Age tool, problems of diachronic sequencing (or lack thereof) are of particular relevance. Especially problematic is the *backtracking* tendency – in other words, a persistent belief held by some scholars that, if a desert road has been travelled in the Modern period, it must have been travelled in Antiquity as well, because desert roads do not shift in time: today, it is known that roads evolve and shift in space to adapt to changing climatic and social conditions.⁴ Despite their shortcomings, many desert road maps of Egypt are precise enough to be used to plot the tracks in the desert landscape. What follows is a short review of desert road charts and an appraisal of their usefulness.

The earliest maps drawn by 19th and 20th century explorers are additions to their memoirs and travelogues. They do not attain the precision of satellite images; however, their makers were meticulous enough to annotate their charts with descriptions of traversed landscapes and discovered artefacts that often add much value to these sketches.⁵ These older depictions are of particular use when studying areas that have since been disturbed by climate change, suburban sprawl, agricultural development, and hydropower projects. Without them, it would be exceedingly difficult to reconstruct the ancient road infrastructure of regions such as northern Sinai – choked by shifting sands (sections 4.2 and 4.4), western Maryut – obliterated by suburban sprawl and farming development (section 6.1), and Lower Nubia – flooded by the waters raised by the Aswan Dam (section 6.8).

Out of modern desert road studies that feature a map, one should first mention Lisa Giddy’s 1987 study, titled *Egyptian Oases: Bahariya, Dakhla Farafra and Kharga during*

Pharaonic times. Hers is a detailed and complex map of the Western Desert trails that accompanies the introductory chapter on oases and their links to the Nile Valley. Despite its value, Giddy's map is not entirely reliable. Trajectories of some of her roads are only briefly alluded to in the text, inviting strong suspicions that the author might have perfunctorily drawn them to fill the blanks on the map.⁶ In a similar vein, Robert Morkot's 1996 article on *Darb el-Arbain, the Kharga Oasis and its Forts, and Other Desert Routes* comprises several detailed desert road maps that nevertheless show diachronic irregularities. Morkot is happy to draw modern, medieval, and ancient roads on the same charts, although it is not altogether certain whether the modern tracks overlie the older trails.⁷ By the same token, Robert Jackson, in his 2002 work titled *At Empire's Edge: Exploring Rome's Egyptian frontier*, included a map of the Egyptian deserts that depicts unknown roads radiating southwest from Dakhla, Farafra, and Kharga oases to remote desert sites, such as Libyan Kufra, Gebel Uweinat, and Bir Tarfawi.⁸ Crucially, no evidence exists for these roads ever being travelled in the Roman period, and their putative courses are a point of contention in the scholarly community.⁹ Giddy, Morkot and Jackson's works made significant contributions to our knowledge about desert roads of Egypt, but their tendency to extend desert roads beyond what evidence demonstrates reduces their maps' reliability.

In this context, the Eastern Desert road map featured in Steven Sidebotham's *Berenike and the Ancient Maritime Spice Route* (2011) is a marked improvement. The author devotes an entire chapter to the Nile Valley–Red Sea roads and meticulously embeds the cartographic data in the archaeological material, drawing maps that are simultaneously detailed and comprehensible. Granted, it could be argued that Sidebotham charts the Eastern Desert trails so well because to follow them is inherently simpler than to follow their Western Desert counterparts, as the Eastern Desert trails customarily run along dry wadi beds and are thus much easier to spot in the desert landscape. Regrettably, no work similar in scope to Sidebotham's survey has been written for the Western Desert trails. One can hope that future surveys and advances in satellite imaging will eventually provide scholars with enough data on the Western Desert roads to incite someone to create an annotated desert road map that surpasses Sidebotham's in scope and readability.

Finally, those investigating the desert trails of Roman Egypt may refer to Richard Talbert's *Barrington Atlas of the Greek and Roman World* (2000). A cartographic compendium of immense value, the *Barrington Atlas* marks the most important desert roads. In contrast to other treatises, the *Atlas* errs on the side of caution: it rarely features 'imaginary' roads, with most trails either ground checked for reliability or not drawn at all.¹⁰ The *Atlas*'s disadvantages are that, being a general atlas of the Empire, it is not as detailed as Sidebotham's sketches, it does not include detailed textual descriptions of the roads in their context, and its use of out-of-date scholarship entails that trajectories of some desert trails have since been redrawn as our knowledge grew. The *Barrington Atlas* does, however, provide a supplement to every map with general commentary about depicted regions, a laudable practice I follow and which should be adopted by every author dealing with ancient topography. Accordingly, what this

volume intends to do is to build upon the achievements of previous mapmakers while remedying technical shortcomings that crept into their charts. In many ways, I believe that the maps of the desert roads in Egypt under the Romans constitute the heart of this book: they elucidate road descriptions, provide quick reference material, and provide cues that cannot be gleaned from text alone.

1.3.2. Maps of this volume: methodology and sources

All maps, charts, and tables in this volume were drawn and compiled by me. Twenty-one desert road maps were placed throughout the text to clarify roads described in the main text. Following the good practice of the *Barrington Atlas of the Greek and Roman World*, I provide a short textual commentary ('text box') to almost every map, commenting upon the general topography of the depicted region, the sources for regional desert trail trajectories, and the difficulties encountered while plotting specific trails. Moreover, every text box lists desert roads in the region and points readers to sections in which these trails are discussed in greater detail. Three maps (nos 1, 4 and 12) are not paired with a text box description. The first one (Map 1) is a general map of desert trails of Roman Egypt, to be taken as general reference material. The second map, depicting trails and canals of the Eastern Delta (Map 4), shares its commentary with the preceding chart (Map 3), whereas the third map (Map 12), outlining the desert situated west of Manf (Memphis), is described in sections 6.2.2 and 6.2.3, obviating the need for a separate text box commentary.

Maps of this volume were drawn from many sources, including satellite images, military topographical maps, archaeological charts and drawings that accompanied memoirs of early desert travellers. Building on Google Earth satellite images, I redrew the charts to include relevant archaeological sites and terrain features. As a rule, I copied positions of archaeological sites from maps featured in site and regional surveys, intentionally displacing certain unsecured sites to safeguard them against looting. If the regional surveys were not specific enough, I would then draw information from broad-scope studies, such as the *Barrington Atlas of the Greek and Roman World*, Sidebotham's *Berenike and the Ancient Maritime Spice Route*, and Giddy's *Egyptian Oases*. The data drawn from these books were supplemented with information from online gazetteers of ancient sites, such as *Pleiades* and *Trismegistos Places*.¹¹ I referred to U.S. Army maps of North Africa (Series P502, 1954–, scale 1:250000) to chart minor topographical features such as wells and wadis. These maps, drawn in the mid-20th century CE, faithfully capture features of the desert as it has been before the economic development irrevocably changed the topography of Egypt.¹²

Regarding cartographic labelling, maps in this book depict seas, lakes, rivers, prominent topographical features (mountains, depressions, cliffs/escarpments, plateaus) as a background upon which ancient road trajectories are superimposed to demonstrate the interaction between the road itself and the terrain through which it ran. The roads on the maps were classified into three categories, according to their likelihood of having been travelled in the Roman period. The first category comprises roads that show solid evidence of regular traffic under the Romans.

The second category includes roads that either (1) show inadequate evidence of Roman-era traffic, (2) appear to have been lightly travelled under the Romans, or (3) are likely to have seen some Roman-era traffic but were not properly surveyed. In sum, this category encompasses trails for which Roman-era traffic is likely, but cannot be incontrovertibly proven with the available data. Finally, the third category comprises roads for which evidence of Roman-era traffic is scant, non-existent, or undocumented. Admittedly, all these distinctions are arbitrary and must be taken with a grain of salt: readers are advised to carefully consider the presented evidence contained within the text and form their own opinions about the chronology of desert trail use.

1.3.3. The list of Arabic, Hebrew, Greek and Latin toponyms represented on maps of this volume

The following list, compiled to be used as references, encompasses place names found on maps of this volume. Consequently, it excludes terrain features and sites of minor importance, left out due to space constraints; these minor toponyms are included in the general index at the end of this book. I adopted the following list of rules for rendering toponyms:

1. The first column of the list provides names of depicted sites in a modern language – most commonly, Arabic.
2. Each entry refers the reader to a map on which the relevant site can be found.
3. Modern sites identified with ancient toponyms are given their Greek (transliterated) and/or Latin names.
4. Every book concerned with ancient Egypt has to deal with the problem of how to transliterate the modern Arabic place names. In this work, I have attempted to the best of my ability to introduce a unified spelling system; however, some inconsistencies remain. When searching for a specific site, it is often easier to look for its ancient toponym (if available). Concerning the el-/al- prefixes in Arabic, I have opted to use the al- variant, following the practice adopted by Sidebotham, Hense and Nouwens in their *Illustrated Archaeology of Egypt's Eastern Desert*.¹³
5. Some sites in Sinai and Negev are rendered in Hebrew: these are marked with [Hebr.] annotation.
6. Sites best known by their English names are rendered in English.
7. When a modern site was identified with an ancient toponym, both names are given. If both Greek and Latin toponyms had survived, I would usually prioritise Latin over Greek to reflect the Roman-era focus of this work, with the Greek alternative chosen if attested more frequently. Some Greek toponyms are known to lack accents and are rendered without them.
8. An italicised Graeco-Roman name in the Arabic column denotes the site is chiefly known by its ancient name.

9. Sites labelled as ‘unidentified’ have toponyms known from ancient literary sources but no modern identification.
10. When more than one ancient toponym is known, the preferred ones are marked in bold.
11. Identifications of modern sites with ancient toponyms labelled with (?) are uncertain.

Table 1.1 The list of Arabic, Hebrew, Greek and Latin toponyms represented on maps of this volume

<i>Modern name (Arabic / Hebrew / English)</i>	<i>Greek</i>	<i>Greek (transliterated)</i>	<i>Latin (prioritised for ancient names unless marked otherwise)</i>	<i>Map no.</i>
al-Ashmunein	Ἑρμοῦ πόλις Μεγάλη	Hermou polis Megale	Hermopolis Magna /Hermupolis	14
Abar al-Kanayis				13
‘Abbad				10
Abraq				10
Abu Diyeiba				9
Abu Gariya				9
Abu Gerara				15, 21
Abu Gerida				9
Abu Ghalqa				10
Abu Ghusun			Cabalsi	10
Abu Greiya				9
Abu Greiya	Διός	Dios	Iovis/Dios	10
Abu Heilig North				10
Abu Heilig South				10
Abu Mazruh				3
Abu Menas			Sanctus Mennas	11
Abu Midrik				10
Abu Rahal				8, 10
Abu Sha’ar				8, 9
Abu Sha’ar al-Bahri				8
Abu Sighawal Pass				16, 21
Abu Sir	Ταποσιρις	Taposiris	Taposiris/ Taposiris Magna /Tapostri	11

Table 1.1 The list of Arabic, Hebrew, Greek and Latin toponyms represented on maps of this volume (Continued)

Modern name (Arabic / Hebrew / English)	Greek	Greek (transliterated)	Latin (prioritised for ancient names unless marked otherwise)	Map no.
Abu Zawal				8, 9
Abu Ziyar				16
Aghurmi	Ἀμμωνος ἱερόν	Ammonos Hieron	Hammon	13, 20
Ain al-Dalla				15
Ain al-Furtaga				7
Ain al-Qadeis				5, 6
Ain al-Qudeirat (Kadesh Barnea)				5, 6
Ain al-Rayan al-Bahariya				14
Ain al-Rayan al-Qibli				14
Ain al-Wadi				15, 20
Ain Amur				15, 21
Ain Gib				21
Ain Hudera				7
Ain Labakha				21
Ain Musa			Phoinikon (?)	4
Ain Om Tabaghabagh				13, 20
Ain Shams	Ἡλίου πόλις	Heliou polis	Heliopolis /Solis oppidum	4
Ain Soukhna				8
Ain Umm Dabadib				21
Akhmim	Πανὸς πόλις	Panos polis	Panopolis /Pano	15, 16
al Qassabat al-Gharbiya			Monocaminum / Monogami	11
al Qassabat al-Shaqiya				11
al-'Uqsor	Πεντάσχοινον (?)	Pentaschoinon (?)	Pentaschoenum (?)	3

Table 1.1

<i>Modern name (Arabic / Hebrew / English)</i>	<i>Greek</i>	<i>Greek (transliterated)</i>	<i>Latin (prioritised for ancient names unless marked otherwise)</i>	<i>Map no.</i>
Alam Shalut				11
al-Aras				9
al-A'reg				20
al-Arish	Ῥινοκόλουρα	Rinokoloura	Rhinocolura	3
al-Bahnasa	Ὀξύρυγχος	Oxyrynchos	Oxyrynchus	14
al-Bisri				13
al-Bordan	Χειμω	Cheimo	Cheimo /Che	11
al-Buwaib				10
al-Dab'a			Caportis (?)	13
al-Deir				21
al-Dweig	Φαλακρον	Phalakron	Falacro /Philacon (?)	10
Alexandria/ al-'Iskandariyya	Ἀλεξάνδρεια	Alexandreia	Alexandria	11
al-Felusiye	Ὀστρακίνη	Ostrakine	Ostracine	3
al-Gels	Κάσιον	Kasion	Casium	3
al-Gotta			Pnigeus (?)	13
al-Hamrah				10
al-Harra				14
al-Hayz				14, 20
al-Heita				9
al-Ileigha				10
al-Imayid	Ἁλμυρά (?)	Halmyra (?)	Halmyra (?)	11
al-Iteima				10
al-Kab	Εἰλειθυίας πόλις	Eileithyas polis	Eileithyia polis/ Leucotheae	10
al-Kanais	Ὑδρευμα τὸ ἐπὶ τοῦ πανείου	Hydreuma to epi tou paneiou		8, 10
al-Karyun	Σχεδία	Schedia		11
al-Kraymat				8

Table 1.1 The list of Arabic, Hebrew, Greek and Latin toponyms represented on maps of this volume (Continued)

Modern name (Arabic / Hebrew / English)	Greek	Greek (transliterated)	Latin (prioritised for ancient names unless marked otherwise)	Map no.
al-Madfouneq	Ἀβυδος	Abydos	Abydus	15, 16
al-Mafariq				16, 18
al-Matula				10
al-Mehemdiye	Γέρρα	Gerra	Gerra /Gerrha	3, 4
al-Muweih	Κροκοδιλώ	Krokodilo	Krokodilo	10
al-Qasr (Dakhla)				15, 20, 21
al-Qasr (Farafra)				15, 20
al-Qasr (Kharga)				18
al-Rizerqat	Κροκοδίων πόλις	Krokodilon polis (Krokodilopolis)		15, 16, 17
al-Saqqia				9
al-Shabb				18
al-Zawya				11
al-Zaytun				13, 20
al-Zerqah	Μαξιμιανόν	Maximianon	Maximianum	10
Aniba				18
An-Nakhl				7
<i>Aphnaium</i> (unidentified)	Ἀφναίον	Aphnaion	Aphnaium	3
Aqaba/Elath	Αἴλανος – Αἴλανα – Βερενίκη	Ailanos/Ailana/ Aila /Berenike	(H)aila/Ailana	7
Armant	Ἑρμωνθίς	Hermonthis	Hermunthis	10, 17
Arqub al-Baghla				17
Aswan	Συήνη	Syene	Syene	8, 10, 15, 16, 18, 19
Asyut	Λύκων πόλις	Lykon polis	Lycopolis /Lyco	15, 16
Atrash Northeast				9
Avdat [Hebr.]	Ἐβοδα	Eboda	Oboda	5, 6
Bab al-Mukhenig				9
Badia'				9

Table 1.1

<i>Modern name (Arabic / Hebrew / English)</i>	<i>Greek</i>	<i>Greek (transliterated)</i>	<i>Latin (prioritised for ancient names unless marked otherwise)</i>	<i>Map no.</i>
Bahig				11
Bahrein (Egypt. Imespep?)				20
Balat				15, 21
Baris				15, 16, 18
Barramiya				10
Bawiti	Ψωβθις (?)	Psobthis (?)	Psofthis (?)	14, 20
Beerotayim [Hebr.]				5, 6
Beersheba	Βηροσαβα	Berosaba	Birosaba	5, 6
Beni Adi				15, 16, 18
Bezah				10
Bir (Umm/al-) Hammamat				8, 9, 10
Bir Abu Darag				8
Bir Abu Hashim				8, 10
Bir Abu Minqar				15, 20
Bir Abu Safa				8, 10
Bir al-Abd				3
Bir al-Heisi				7
Bir al-Maghara				5
Bir al-Mazar				3
Bir al-Nuss				3
Bir as-Sawra				7
Bir Dikkar				15, 20
Bir Hassana				5, 6
Bir Hawashiya				8
Bir 'Iayyan				10
Bir Kiseiba				18
Bir Madkur				5, 6

Table 1.1 The list of Arabic, Hebrew, Greek and Latin toponyms represented on maps of this volume (Continued)

Modern name (Arabic / Hebrew / English)	Greek	Greek (transliterated)	Latin (prioritised for ancient names unless marked otherwise)	Map no.
Bir Mayein				6
Bir Menih				10
Bir Nakheil				10
Bir Nakheila				16, 18
Bir Nakhlai				18
Bir Qarawein				15, 20
Bir Sahara				18
Bir Salah				9
Bir Sirbakis				9
Bir Tarfawi				18
Bir Umm Fawakhir	Πέρσου	Persou	Persu	10
Bir Wasif				9
Buhen				18
Bukhalug				9
Bulaq				15, 16, 21
Bulaq Pass				16, 21
Cairo	Βαβυλών	Babylon	Babylon	4
Chabrias' Camp (unidentified)	Χαβρίου Χάραξ	Chabriou Charax	Chabriae Castra	3
Chephren's Quarries				18
Contra Apollonos (unidentified)				10
Contra Syene (unidentified)				19
Contra Talmis (unidentified)				10
Contra Taphis (unidentified)				10

Table 1.1

<i>Modern name (Arabic / Hebrew / English)</i>	<i>Greek</i>	<i>Greek (transliterated)</i>	<i>Latin (prioritised for ancient names unless marked otherwise)</i>	<i>Map no.</i>
Dabod	Παρεμβολή	Parembole	Parembole	10, 19
Daghabag	Κομπάσι (?)	Kompasi (?)	Compasi (?)	10
Daghabag South				10
Dakka	Ψελχίς	Pselchis	Pselchis	18, 19
Damanhur	Ἑρμοῦ πόλις Μικρά	Hermou polis Mikra	Hermopolis Parva	11
Dashur	Τακυρίς	Takyris		12
Dehmit	Χονετμουίς	Chonetmouis		19
Deir Abu Sha'ar al-Qibli				9
Deir al Badr				9
Deir al-Atrash				8, 9
Deir Umm Diqal				9
Dendur	Τουτζίς	Toutzis	Tutzis	19
Derasiya	Δέρρις	Derrhis	Derras	11
Dimeh	Σοκνοπαιου Νῆσος	Soknopaiou Nesos		14
Dunqash				10
Dunqul Oasis				18
Dush	Κυσίς	Kysis		15, 16, 18
Dush Pass (Bab al-Dush)				16, 18
Edfu	Ἀπόλλωνος πόλις Μεγάλη	Apollonos Polis Megale	Apollonopolis Magna	8, 10, 15, 16
Enaton (unidentified)	Ἔνατον	Enaton		11
Esna	Λάτων πόλις	Laton polis	Latopolis	10, 15, 16
Ezba Mahattet	Σεραπείον (?)	Serapieion (?)	Serapeum (?)	4
Farshut				15, 16, 17
Fatireh al-Beida				9

Table 1.1 The list of Arabic, Hebrew, Greek and Latin toponyms represented on maps of this volume (Continued)

Modern name (Arabic / Hebrew / English)	Greek	Greek (transliterated)	Latin (prioritised for ancient names unless marked otherwise)	Map no.
Fatireh al-Beida al-Qibli				9
Feiran Oasis / Tell al-Mekharet	Φαραν	Pharan	Pharan /Faran/ Phara	7
Garawla				13
Gaza	Γάζα	Gaza	Gaza	5, 6
Gazirat Firaun (Pharaoh's Island)				7
Gebel Antef				17
Gebel Barqa				16, 18, 19
Gebel Dokhan	Πορφυρίτης/ Πορφυρίτου ὄρος	Porphyrites/ Porphyritou oros	Porphyrites/ (Mons) Porphyrites	8, 9
Gebel Gharra				18, 19
Gebel Ghennima				21
Gebel Ghorabi				14
Gebel Gulab				19
Gebel Musa/ St. Catherine	Ἅγιον ὄρος/ Σιναί	Hagion oros/Sinai	Syna	7
Gebel Qarn al-Gir				16, 17
Gebel Rokham				10
Gebel Tingar				18, 19
Gebel Tjauti				17
Gebel Umm Rinna				7
Gebelein	Παθυρίς/ Ἀφροδίτης πόλις	Pathyris / Aphrodites polis	Veneris oppidum	10
Gerasa (unidentified)	Γερασά	Gerasa		5, 6 (?)
Gerf	Ξηρόν Πέλαγος	Xeron Pelagos	Xeron/ Aristonis	10
Ghuzza				9
Gidami				9

Table 1.1

<i>Modern name (Arabic / Hebrew / English)</i>	<i>Greek</i>	<i>Greek (transliterated)</i>	<i>Latin (prioritised for ancient names unless marked otherwise)</i>	<i>Map no.</i>
Girga	Θις	This	Thinis	15, 16
Grafon [Hebr.]				6
Halfet al Bir				21
Haluza [Hebr.]	Ἑλουσα	Elousa	Elusa	5, 6
Hamesh				10
Har Massa [Hebr.]				6
Hawariyya	Μάρεια/ Μαρεῶτις	Mareia/Mareotis	Marea /Mareotis	11
Helouan				8
Hilan				10
Horvat Beer Shema [Hebr.]	Βιρσαμῖς (?)	Birsamis (?)	Birsama (?)	6
Horvat Ma'agurah [Hebr.]				6
Horvat Qazra [Hebr.]				6
Hu	Διὸς πόλις Μικρά	Dios Polis Mikra	Diospolis Parva	16, 17
Ihnasya al-Medina	Ἡρακλέους πόλις Μεγάλη	Herakleous polis Megale		14
Ismant al-Kharab	Κελλῖς	Kellis		21
Jaghbub				13
Jaja				15, 16
Jaja Pass				16
Jaquab 00/23				15
Kalabsha	Ταλμῖς	Talmis	Talmis	8, 10, 18, 19
Kharga	Ἰβῖς	Hibis	Hibeos	15, 16, 21
Khashm al-Eish				11
Khashm al-Menih	Δίδυμοι	Didymoi	Didymoi/Dios	10
Khasm al Qaud				11
Khawr al-Gir	Ἀφροδίτης	Aphrodites	Aphrodito	8, 10

Table 1.1 The list of Arabic, Hebrew, Greek and Latin toponyms represented on maps of this volume (Continued)

Modern name (Arabic / Hebrew / English)	Greek	Greek (transliterated)	Latin (prioritised for ancient names unless marked otherwise)	Map no.
Khirbet Abu Shaqafa				4
Khirbet Sufaysif				6
Khirbet Suq Mazen	Συκομάζων	Sykomazon		5, 6
Khirbet Umm Khuntera				6
Kom Abu Billo	Τερενουθις	Terenouthis	Terenuthis	11
Kom al-Geif	Ναύκρατις	Naukratis	Naucratis	11
Kom al-Nugus	Πλινθίνη	Plinthine	Plinthine	11
Kom Aushim	Καρανίς	Karanis	Caranis	14
Kom Ombo	Ὀμβοί	Omboi	Ombos	16, 18, 19
Kubbaniya				19
Kuntillet Ajrud				5, 6
Kuntillet Girafi	Γυψαρία (?)	Gypsaria (?)	Gypsaria (?)	5, 6
Kurkur Oasis				18, 19
Laqeita	Φοινικῶν	Phoinikon	Phoenicon/ Poeniconon	10
Luxor/Thebes	Διὸς πόλις Μεγάλη/Θήβαι	Dios Polis Megale/ Thebai	Diospolis Magna/ Thebae	8, 10, 15, 16, 17
Maghrabiya				9
Maharraqa	Ἱερὰ Συκάμιнос	Hiera Sykaminos	Hiera Sycaminos	8, 10, 18, 19
Mahattit Ziyar				8
Romaniya				
Makhareg				8
Makhareg Gharb				8
Mamshit [Hebr.]	Μαμψις	Mampsis	Mampsis	5, 6
Manf	Μεμφις	Memphis	Memphis	4, 12
Marina al-Alamein	Ἀντίφραι (?)	Antiphrai (?)	Antiphrae (?)	11, 13
Marsa Abu Samra			Pedonia (?)	13
Marsa Baqqush	Ζυγρίς	Zygris	Zygris/ Zygrae	13

Table 1.1

<i>Modern name (Arabic / Hebrew / English)</i>	<i>Greek</i>	<i>Greek (transliterated)</i>	<i>Latin (prioritised for ancient names unless marked otherwise)</i>	<i>Map no.</i>
Marsa Bomba	Αἰνησίσφυρα	Ainesisphyra	Ainesisphyra	13
Marsa Dabr/Marsa Nabiyah				8
Marsa Matruh	Παραϊτόνιον	Paraitonion	Paraetonium	13
Marsa Nakari	Νεχεσία (?)	Nechesia (?)	Nechesia (?)	8, 9
Matan Frayn				13
Medinet al-Fayum	Κροκοδίλων πόλις	Krokodilon polis (Krokodilopolis)	Arsinoe/Crialon	14
Medinet al-Haras	Βερενίκη	Berenike	Berenice	8, 9
Medinet Habu	τὰ Μεμνόνεια	ta Memnoneia	Memnonia/ Memonia	17
Meri 99/55				15, 21
Mezad Ma'ale Mahmal [Hebr.]				6
Mitla Pass				7
Monastery of St. Anthony	μονή τοῦ μεγάλου Ἀντωνίου	Mone tou megalou Antoniou	Sancti Antonii monasterium	7, 8
Monastery of St. Paul			Sancti Pauli monasterium	7, 8
<i>Mons Claudianus</i>	Κλαυδιανόν	Klaudianon	Mons Claudianus	8, 9
Mount Odeid [Hebr.]	Γουββα (?)	Goubba (?)	Goubba (?)	6
Mount Ramon [Hebr.]	Λυσα (?)	Lysa (?)	Lysa (?)	5, 6
Moyat Awad [Hebr.]			Kalgouia (?)	5, 6
Mut	Μωθίς	Mothis		15, 21
Naqada				17
Naqb Shusina				21
Neqarot [Hebr.]				5, 6
Nitzana [Hebr.]	Νεσσανα	Nessana	Nessana	5, 6
NKOS surface anomaly				21

Table 1.1 The list of Arabic, Hebrew, Greek and Latin toponyms represented on maps of this volume (Continued)

Modern name (Arabic / Hebrew / English)	Greek	Greek (transliterated)	Latin (prioritised for ancient names unless marked otherwise)	Map no.
Northern Outpost				21
Nugrus				10
Nuq Maneih				15, 16, 18, 19
Nuwemisa				20
<i>Oktokaidekaton</i> (unidentified)	Ὀκτωκαιδέκατον	Oktokaidekaton		11
<i>Pempton</i> (unidentified)	Πεμπτόν	Pempton		11
Petra	Πέτρα	Petra	Petra	5, 6
<i>Philae</i>	Φιλαι/Φιλη	Philai/Phile	Philae	8, 10, 19
Pot Rock				21
Qamula				17
Qar al-Mahalle [Hebr.]				5, 6
Qara	Ἀλεξάνδρου Παρεμβολή/ Σίροπον (?)	Alexandrou Parembole/ Siropon (?)	Alexandri Castrum/ Siropon (?)	13
Qasr al Qatagi				11
Qasr al-Banat				10
Qasr al-Gib				16
Qasr al-Someira				21
Qasr Ibrim	Πριμις	Primis	Primis /Primi	18
Qasr Qarun	Διονυσιάς	Dionysias	Dionisias	14
Qasrawet (Nabataean Awiti?)				3, 4
Qatia				3, 4
Qattar				9
Qena	Καινή/Καινή πόλις	Kaine	Cenopoli/Caene/ Maximianopolis	8, 10, 15, 16, 17
Quei				8, 9
Qertassi	Τίτις	Titis	Tzitzi / Tzitzis	10, 19

Table 1.1

<i>Modern name (Arabic / Hebrew / English)</i>	<i>Greek</i>	<i>Greek (transliterated)</i>	<i>Latin (prioritised for ancient names unless marked otherwise)</i>	<i>Map no.</i>
Quft	Κοπτος	Koptos	Coptos	8, 10, 16, 17
Qus	Ἀπόλλωνος πόλις Μικρά	Apollonos polis Mikra	Apollonopolis Parva /Chus	17
Quseima				4
Quseir al-Qadim	Μυὸς Ὀρμος	Myos Hormos	Myos Hormus	8, 9
Rafa [Hebr.]	Ῥαφία	Raphia	Raphia	5
Ramia Pass				16, 21
Refuf Pass				16, 21
Rehovot [Hebr.]	Βετομολαχον (?)	Betomolachon (?)		5, 6
Rod al-Buram				8, 10
Rod al-Legah				10
Rod Legaya				10
Rod Umm al-Farraj				10
Rumani				3
Sallum	Κατάβαθμος Μέγας	Katabathmos Megas	Catabathmus Maior	13
Samut				10
Saqia				9
Selima Oasis				18
Semna	Ὀφιατης	Ophiates	Ophiates	8, 9
Serabit al-Khadim				7
Seyala	Σιμίου (?)	Simiou (?)	Simiou (?)	10
Seyhrig				10
Shar Ramon [Hebr.]				5, 6
Shay'iet				10
Sheikh 'Ibada	Ἀντινόου πόλις	Antinoou polis	Antinoopolis /Antinou/Antenou	8
Sheikh Salem				10

Table 1.1 The list of Arabic, Hebrew, Greek and Latin toponyms represented on maps of this volume (Continued)

Modern name (Arabic / Hebrew / English)	Greek	Greek (transliterated)	Latin (prioritised for ancient names unless marked otherwise)	Map no.
Sheikh Zuweid				4
Shenshef				10
Shivta [Hebr.]	Σοβατα	Sobata	Sobata	5, 6
Sibrit				10
Sidi Abd al Ati				11
Sidi Abd al-Rahman			Comaron/ Comaru (?)	13
Sikait				10
Siket				10
Sillim al-Aqabat Pass (Naqb al-Sillim)				14, 20
Sitra				20
Sohag	Βομπαη	Bompae		15, 16
Suez	Κλεοπατρίς	Kleopatris	Cleopatris	4
Sukkari				10
Tafa	Ταφισ	Taphis	Taphis	10, 19
Tahta	Τοετω	Toeto		16
Tal'at Arta				8
Tell al-Eqneiyin/Tell Jenein	Βηθαφου/ Βουταφιος (?)	Betaphou/ Boutaphios (?)	Boutaphios (?)	5
Tell al-Farama	Πηλούσιον	Pelousion	Pelusium	3, 4
Tell al-Hebua (Egypt. <i>Tjaru</i>)	Σελη	Sele	Sile	3, 4
Tell al-Heir/Migdol	Μαγδωλος	Magdolos		3, 4
Tell al-Maskhuta	Πατουμος/ Πιθωμ	Patoumos/Pithom	Pithom	4
Tell al-Sheikh	Βιτύλιον (?)	Bitylion (?)	Bytl (?)	5, 6
Tell Basta	Βουβαστις	Boubastis	Bubastis	4
Tell Ras Budran				7

Table 1.1

<i>Modern name (Arabic / Hebrew / English)</i>	<i>Greek</i>	<i>Greek (transliterated)</i>	<i>Latin (prioritised for ancient names unless marked otherwise)</i>	<i>Map no.</i>
Tell Temilat	Ἰήνυσσος (?)	Ienysos (?)		5, 6
Teneida				21
Teneida Pass (Naqb Tineida)				21
The Towers				17
Themed				7
Themilat Radadi/ Borot Roded [Hebr.]				7
Themilat Suweilma				5, 6
<i>Tiberiane</i>	Τιβεριανή	Tiberiane	Tibereus	9
Timeira				13
Timna				7
Toshka				18
Tundaba				16
Umm al-Baragat	Τεβτυνίς	Tebtynis		14
Umm 'Anab				9
Umm Arba'een				10
Umm Balad				9
Umm Dalfa				9
Umm Garahish				10
Umm Gariya				10
Umm Howeitat				9
Umm Howeitat al-Qibli				8
Umm Huyut				9
Umm Kebabsh				10
Umm Sidri/Umm Sidra				9

Table 1.1 The list of Arabic, Hebrew, Greek and Latin toponyms represented on maps of this volume (Continued)

Modern name (Arabic / Hebrew / English)	Greek	Greek (transliterated)	Latin (prioritised for ancient names unless marked otherwise)	Map no.
Umm Suwagi				8
Valley of the Kings				17
Wadi Abu Gada				7
Wadi Abu Greia			Vetus Hydreuma/ Trogodyticum hydreuma	10
Wadi Abu Shuwehat				9
Wadi al-'Alam				10
Wadi al-Amboot				10
Wadi al-Asal				8
Wadi al-Girafi	Γυψαρία (?)	Gypsaria (?)	Gypsaria (?)	5, 6
Wadi al-Hol/ Gebel Roma				17
Wadi al-Hudi				8, 10, 18, 19
Wadi al-Jarf				7, 8
Wadi Belih				9
Wadi Dabob				8
Wadi Gawasis				8, 9
Wadi Gemal	Ἀπόλλωνος ὑδρευμα	Apollonos Hydreuma	Apollonos	8, 10
Wadi Gharandal			Surandela/ Surandala/ Arandara (?)	7
Wadi Haggag				7
Wadi Hateem				10
Wadi Hinnis				20
Wadi Khashir	Καινὸν ὑδρευμα	Kainon hydreuma	Novum hydreuma	10
Wadi Lahma				10
Wadi Lussan	Λυσα (?)	Lysa (?)	Lysa (?)	5, 6
Wadi Maghara				7

Table 1.1

<i>Modern name (Arabic / Hebrew / English)</i>	<i>Greek</i>	<i>Greek (transliterated)</i>	<i>Latin (prioritised for ancient names unless marked otherwise)</i>	<i>Map no.</i>
Wadi Marra				7
Wadi Menih				10
Wadi Mukkateb				7
Wadi Nagat				9
Wadi Nasb				7
Wadi Qabr				10
Wadi Qalt en-Naga				9
Wadi Qureiya				5, 6
Wadi Safaga	Φιλωτέρας (?)	Philoterias (?)	Philoterias/ Aenum (?)	8, 9
Wadi Samhud				16
Wadi Sidri				7
Wadi Sudr			Medeia (?)	7
Wadi Tuweiba				7
Wadi Umm Dhaya				8
Wadi Umm Jariyan				9
Wadi Umm Sideira				7
Wadi Umm Wikala			Mons Ophiates	9
Wadi Wa'ir				16, 18, 19
Wadi Watir				7
Watifa	Φιλωτερίς	Philoteris		14
Widan al-Faras				14
Yabsa Pass				16, 21
Yotvata [Hebr.]			(B)ossia/Ad Dianam (?)	5, 6
Zafarana				7, 8
Zawiyet Umm al-Rakham	Ἄπις	Apis	Apis	13
Zawyet Razim	Νικίου (?)	Nikiou (?)	Niciae/Niciu (?)	11

1.4. Sources on ancient traffic along desert trails of Egypt

Our knowledge about desert trails plied in Egypt under the Romans comes from several sources, including literary, documentary, and archaeological evidence, all providing us with different ranges of data on desert roads. Literary evidence is defined here as coming from works of Graeco-Roman literature, mostly geographical treatises. Documentary evidence was drawn from diverse sources, including itineraries (road station lists) and administrative/economic documents, often ephemeral records on papyri and ostraca (pieces of broken pottery). The literary evidence deals mostly with generalities of desert travel, whereas documentary evidence provides data on specifics of particular routes and stations. The archaeological evidence comprises data gathered during on-site surveys and excavations, broader land surveys and through remote sensing (including satellite imaging and remote road detection).

All types of evidence yield valuable information, but they also have their limitations. Literary works were written by authors who did not necessarily visit the lands they described, their knowledge often coming from reports of explorers and hearsay; nonetheless, such works often include relevant information about desert trails and goods that were carried along them. Itineraries are lists of road stations and sheltering places; they are of use as sources of ancient toponyms but reveal little about actual road trajectories and conditions on the trail. Documents such as papyri and ostraca matter much when one analyses the economic side of desert trade, as they record goods transported and destinations reached by caravans; however, they often tell us little about the trails themselves, since their itineraries were common knowledge to those who produced these documents. The archaeological evidence deals with surviving physical remains of trails and roadside installations; it tells us where the desert traffic actually concentrated, but only rarely does it tell us directly whether a surveyed site can be securely identified with an ancient place name. The textual evidence, when pertinent, relates to us where the ancient caravans travelled, how long they stayed on the road and in which places they sought shelter. In turn, the archaeological evidence provides us with knowledge about ancient roadside installations and remains of old trails. When combined, archaeological evidence grounds and anchors data gleaned from textual evidence; it often points us to sites and trails unknown from textual sources that were nonetheless travelled during the Roman rule.

1.4.1. Literary evidence

1.4.1.1. Literary texts

Out of many ancient authorities who have expatiated on the subject of desert roads in Egypt, four authors made most significant and valuable contributions to my research, namely Herodotus, Strabo, Pliny, and Ptolemy, their input and relative merits discussed in detail below. Apart from these four, I refer in passing to other ancient writers who mention desert roads and sites of Egypt: since their input is often minor, I do not discuss their relevance, instead providing references to their works in the list below.

HERODOTUS

Herodotus of Halicarnassus, arguably the first ancient Greek historian, described Egypt and its inhabitants in his *Histories* (published ca. 440 BCE), occasionally touching upon desert trails of this country. Some of Herodotus' most interesting remarks pertain to the topography of the Western Desert. The author believed a great ridge of sand stretched across the entire Sahara Desert, from Thebes in the east to the Strait of Gibraltar in the west; were one to travel westwards across the purported ridge, every ten days, one would encounter an agricultural community centred around a freshwater spring flowing from a salt-encrusted mound.¹⁴ Some authorities believe Herodotus may have deliberately or unknowingly alluded to the chain of oases in the Libyan Desert, stretching from Kharga, Dakhla, Farafra, Bahariya, Siwa, Jaghbug and beyond; nonetheless, the distances and topographies of these oases considerably differ from the descriptions provided by Herodotus.¹⁵ Much of the Herodotean material on Egypt concerns the Persian invasion of the country, with special attention devoted to desert exploits of the Persian monarch Cambyses. Herodotus' account states that, on the eve of the Persian conquest of Egypt, Cambyses followed the desert road from Gaza to Pelusium; having obtained the right of passage from an Arab chieftain of the land, the king and his army crossed the plain with relatively little difficulty, thanks to water-filled camel skins left at regular intervals along the road by his Arab allies.¹⁶ Conquering Persians saw the importance of this link between Egypt and Asia, and they made sure the native tribesmen kept the road-stations along the coast well-supplied with water, stored in earthen jars placed along the road.¹⁷ Having conquered Egypt, Cambyses purportedly sent out an army of fifty thousand men against Siwa, who crossed from Thebes to Kharga in seven days and went into the desert never to be seen again.¹⁸ If there were such an expedition, the soldiers must have turned northwest at either Farafra or Bahariya, and they lost their way somewhere on the northern fringes of the Great Sand Sea.¹⁹ Generally speaking, Herodotus' account of Egyptian deserts is fanciful, yet sporadically accurate, and it provides us with several interesting pieces of data, some of them unverifiable.

STRABO

Strabo (64/63 BCE–24 CE), a Roman scholar of Greek extraction and an author of a universal geographical treatise simply known as *Geography*, considers desert areas of Egypt in numerous passages. The author was most interested in the rectangle of land between towns of Qena (ancient Kaine), Edfu (ancient Apollonopolis Magna), Quseir al-Qadim (ancient Myos Hormos), and Medinet al-Haras (ancient Berenike), recognising it as a desert isthmus – a narrow strip of the Eastern Desert where the crossing between the Red Sea and the Nile Valley is most convenient.²⁰ Strabo mentioned two roads (*Hodos Mysormitike/Hodos Berenikes*) linking the chief Red Sea ports (Myos Hormos/Berenike) to the Nile Valley. Strabo maintained that, in his day, Myos Hormos was the primary port of call for importing Eastern wares, which could be crossed in about seven days from the port to the Valley along the road known as

Hodos Mysormitike (section 5.2.4).²¹ In contrast, the road to Berenike (*Hodos Berenikes*, section 5.2.5) was significant enough to merit a mention in Strabo, but he attached less importance to that port and consequently did not describe its access road in detail.²² Berenike for Strabo was chiefly the place where Ptolemaic elephant hunting expeditions came ashore; from there, the handlers drove captured beasts along yet another desert road to Edfu (section 5.2.6), where they were floated downstream to Alexandria.²³ Other Egyptian desert localities described by Strabo are often sea ports on the fringes of the Eastern Desert. Strabo mentioned Clysma, a Red Sea port at the northwestern tip of the Gulf of Suez,²⁴ Elath (ancient Aila), a port and important spice trade market at the northeastern tip of the Gulf of Aqaba²⁵ and finally Philoterias/Aenum,²⁶ an as-yet-unidentified port in the vicinity of modern Wadi Safaga. Of great interest to the author was also the Sirbonitic spit (section 4.2.2) that separates Lake Bardawil from the Mediterranean;²⁷ last, he also examined the Abydos-Kharga trail in the Western desert (section 6.6.1), customarily crossed in seven days, and claimed it saw much traffic in the early 1st century CE.²⁸ Unlike Herodotus' *Histories*, Strabo's *Geography* is considered a more reliable source and a mine of background information on the deserts of Roman Egypt.

PLINY

Pliny the Elder (23–79 CE), a Roman naturalist and natural philosopher, is chiefly known for his *Natural History* (published ca. 77–79 CE), a comprehensive encyclopaedia on the Roman world as Pliny knew it; several passages in this work refer to the Egyptian deserts and are of use to those researching them. Significantly, Pliny wrote on several desert roads of Roman Egypt. Pliny devoted more attention to *Hodos Berenikes* (section 5.2.5) than Strabo, enumerating road stations and specifying distances between them;²⁹ his interest in this access trail to Berenike stems from the fact that Pliny's Berenike became the chief point of entry for the Eastern wares, with Myos Hormos demoted to a secondary role.³⁰ Some pieces of data on desert roads appear exclusively in the *Natural History*. By the Gulf of Suez, Pliny placed the town of Arsinoe, from where three rarely mentioned roads radiated northwards to link it to the Mediterranean communities of Pelusium, Casium, and Gerra (section 4.4).³¹ Just like Strabo, Pliny discussed the run of several roads of the Western Desert, such as Masrab al-Muhashas, which linked Memphis to Siwa (section 6.3.1);³² nonetheless, both authors indicate that Eastern Desert trails were of greater importance to the Empire.

PTOLEMY

Claudius Ptolemy (90–168 CE) was a Graeco-Egyptian scholar based in Alexandria and an author of a universal geographical treatise simply known as *Geography*. Of interest to this study is the gazetteer section of his work that records longitudes and latitudes of many desert sites in Roman Egypt; Ptolemy's coordinates can be converted into modern degrees of latitude and longitude, but his data do not always tally with modern coordinates and sometimes yield inconclusive results. Ptolemy's

data were used by archaeologists looking for the lost Red Sea ports of Philoteras/Aenum³³ (section 5.2.3) and Nechesia³⁴ (section 5.2.7), or for the elusive Western Desert site of Siropon (section 6.3.1);³⁵ initial digs based on Ptolemy's coordinates yielded promising results, but work is necessary before these sites can be securely identified.

1.4.1.2. List of literary sources referenced

The following list guides the reader to works and editions of ancient authors I quoted or referred to, with authors listed with their full names, short profiles, and titles of referenced works and editions.

Arrian (Lucius Flavius Arrianus), a Greek historian, military commander and philosopher, ca. 86/89–ca. 146/160 CE.

The Anabasis of Alexander = *Alexandri Anabasis*, ed. A. G. Roos and G. Wirth, Teubner, Stuttgart, 2002.

Cassius Dio (Cassius Dio Cocceianus), a Graeco-Roman statesman and historian, ca. 155–ca. 235 CE.
Roman History = *Dionis Cassii Cocceiani historia romana*, ed. L. Dindorf, Teubner, Leipzig, 1863.

Claudius Ptolemy (Claudius Ptolemaeus), a Graeco-Roman mathematician, astronomer, geographer and astrologist, ca. 100–170 CE.

Geography = *Geographica*, ed. W. Hübner, Teubner, Leipzig, 1998.

Diodorus (Diodorus Siculus), a Greek historian, 1st century BCE.

Historical Library = *Diodori Bibliotheca historica*, ed. I. Bekker, L. Dindorf and F. Vogel, Teubner, Leipzig, 1888–1906.

Herodotus (Herodotos), a Greek historian, chiefly known for chronicling the Persian Wars in his *Histories*, ca. 484–ca. 425 BCE.

The Histories = *Historiae*, ed. R. Dietsch, Teubner, Leipzig, 1903–1906.

Hierocles (Hierokles), a Byzantine geographer, 6th century CE.

Synecdemus = *Le Synekdemòs d'Hiérokès et l'opuscule géographique de Georges de Chypre*, ed. E. Honigmann, Institut de philologie et d'histoire orientales et slaves, Bruxelles, 1939.

Josephus (Titus Flavius Josephus), a Romano-Jewish scholar, historian and hagiographer, 37–ca. 100 CE.

The Jewish War = *Bellum Judaicum* [in] *Flavii Iosephi Opera omnia*, ed. S. A. Naber, Teubner, Leipzig, 1888–1896.

Jewish Antiquities = *Antiquitates Iudaicae* [in] *Flavii Iosephi Opera omnia*, ed. S. A. Naber, Teubner, Leipzig, 1888–1896.

Krinagoras (Crinagoras of Mytilene), a Greek epigrammatist, ambassador and court poet, ca. 70–18 BCE.

Anthologia Palatina = *Anthologia Graeca I. Buch I–VI. II*, ed. H. Beckby, Tusculum-Bücherei, München, 1965–1968.

Lucan (Marcus Annaeus Lucanus), a Roman poet, 39–65 CE.

On the Civil War = *De Bello Civili libri X*, ed. D.R. Shackleton Bailey, Teubner, Leipzig, 1988.

Martianus Capella (Martianus Minneus Felix Capella), a Latin prosaist, late 4th/early 5th century CE.

On the Marriage of Philology and Mercury = *Martianus Capella*, ed. J. Willis, Teubner, Leipzig, 1983.

Pliny the Elder (Gaius Plinius Secundus), a Roman author, naturalist and natural philosopher, 23–79 CE.

The Natural History = *Naturalis historiae*, ed. K. Mayhoffer, Teubner, Stuttgart, 1970–2011.

Translation consulted: Pliny. Natural History, Volume II: Books 3–7, translated by H. Rackham, Harvard University Press, Cambridge, MA, 1942.

Plutarch (Lucius Mestrius Plutarchus), a Greek biographer and essayist, ca. 50–120 CE.

Parallel Lives = *Vitae Parallelae*, ed. C. Lindskog and K. Ziegler, Teubner, Leipzig, 1914–1915.

Procopius (Procopius Caesariensis), a late antique Greek scholar, ca. 500–ca. 554 CE.

The Buildings = *Procopii Caesariensis opera omnia*, Procopius, ed. J. Hauriy and G. Wirth, Teubner, Leipzig, 1962–1964.

Pseudo-Hegesippos, a translator and paraphraser of Josephus' *Jewish War*, ca. 4th century CE.

History = *Hegesippus qui dicitur Historiae libri V*, ed. V. Ussani, VÖAW, Wien/Leipzig, 1932–1960.

Quintus Curtius Rufus, a Roman historian, 1st century CE (?)

Histories of Alexander the Great = *Historiae Alexandri Magni*, ed. E. Hedicke, Teubner, Leipzig, 1908.

Solinus (Gaius Julius Solinus), a Latin grammarian and compiler, ca. early/mid-3rd century CE.

Collection of Curiosities = *C. Iulii Solini Collectanea rerum memorabilium*, ed. Th. Mommsen, Nicolas, Berlin, 1895.

Strabo (Strabon), a Greek geographer, philosopher, and historian, ca. 63 BCE–24 CE.

Geography = *Geographika*, ed. S. L. Radt, Vandenhoeck and Ruprecht, Göttingen, 2002–2011.

Translation consulted: Strabo. *Geography, Volume VIII: Book 17. General Index*, translated by H. L. Jones, Harvard University Press, Cambridge, MA, 1932.

1.4.2. Documentary evidence

1.4.2.1. Itineraries

A type of ancient travel guide, a Roman *itinerarium* listed cities, towns, road stops, inns, and watering points found along a particular road or track; two such lists are of use to those studying road networks of Egypt. The *Antonine Itinerary*, compiled at the break of the 2nd and 3rd centuries and slightly amended in the later period,³⁶ stands for our best authority on many roads of Roman Egypt. Thorough and fairly accurate, it enumerates all major stations on the desert trails and records intervals between them. Roads listed in the *Antonine Itinerary* include:

1. the Sirbonitic road from Tell al-Farama (ancient Pelusium) to Gaza³⁷ (section 4.2.2)
2. *Hodos Berenikes* between Quft (ancient Coptos) and Medinet al-Haras (ancient Berenike)³⁸ (section 5.2.5)
3. the Alexandria–Sallum road: an incomplete listing, the itinerary records stations between Sallum (ancient Catabathmus Maior) and al-Dab'a (ancient Caportis?)³⁹ (section 6.1.1)
4. the Alexandria–Manf (ancient Memphis) road⁴⁰ (section 6.1.2)

The *Peutinger Map* is an illustrated itinerary showing the road network of the entire Roman Empire, surviving as a 12th/13th century copy of an original 4th century Roman map;⁴¹ regrettably, it is of limited use to desert road studies due to numerous lacunae and discrepancies between recorded and actual station intervals. Roads listed in the *Peutinger Map* include:

1. the Sirbonitic road from Pelusium to Gaza⁴² (section 4.2.2)
2. the road from Suez (ancient Cleopatra) to Elath/Aqaba (ancient Aila)⁴³ (section 4.5.2)
3. the road from Jerusalem to Aila (section 4.3.5)

4. *Hodos Berenikes* between Coptos and Berenike⁴⁴ (section 5.2.5)
5. the Alexandria–Sallum road: a complete listing⁴⁵ (section 6.1.1)
6. the Alexandria–Memphis road⁴⁶ (section 6.1.2)

Other minor itineraries and travel guides may be of use to those studying desert roads of Egypt. For instance, one might mention the *Stadiasmus of the Great Sea* (a 3rd century CE Greek sailing handbook), which records sites along the coast of Egypt.⁴⁷ Although not an itinerary *sensu stricto*, the *Stadiasmus* is a valuable resource for those investigating desert trails of the Marmarican coast (section 6.1.1). Moreover, lists of road stations and watering points occasionally appear on papyri and other types of sources; whenever this is the case, such lists are discussed in an appropriate section of this book.

1.4.2.2. Papyri

Papyri, in the context of this book, denote Graeco-Roman documents (legal, economic, administrative, personal) written on surface made of papyrus sedge. Only in the late 1980s have papyri been accepted as a valid and important source for the study of transport and economy in the Roman period, but they have since grown to become one of the most significant sources of knowledge for historians.⁴⁸ Of all preserved papyri in the Roman Empire, Egypt boasts the largest number, with two sites in particular (Mons Claudianus and Oxyrynchus) having yielded troves of papyrological evidence, some of it on the local desert transport.⁴⁹ Today, papyri are increasingly studied in their archaeological context and, as such, they become more relevant to desert road archaeology;⁵⁰ nonetheless, papyri as data sources have inherent limitations one must not ignore. The first is their uneven temporal and spatial coverage. Some areas and periods are overrepresented in surviving collections, and it is often difficult to determine whether a plethora of papyri at one site is a statistical anomaly or an indication of the site's importance.⁵¹ More importantly, different types of papyri are of different relevance to desert road studies. For instance, trade papyri and contracts record immaterial movements of goods and people through the desert. Such texts focus on travel termini, but not on the roads.⁵² In contrast, itineraries and road lists recorded on papyri mention both termini and road stations and, as a result, are more pertinent to this study.⁵³ Finally, administrative papyri reveal oases were governed from specific cities in the Valley,⁵⁴ with the access roads to oases guarded by special desert forces.⁵⁵ Generally speaking, data extracted from papyri are of great value to some subfields of desert road studies, but they must be screened and set in a proper archaeological context in order not to misinterpret the pieces or jump to hasty conclusions.

1.4.2.3. Ostraca

'Ephemeral documents not meant for permanent archives', inscribed shards of pottery, or *ostraca*, bear personal notes and scribbles, some of them pertinent to desert road research.⁵⁶ Found in abundance at some desert sites in Egypt – with Mount Claudianus

having yielded no less than nine thousand inscribed shards – ostraca contain a plethora of data on desert transport, but much of the evidence provided is indirect, confusing and only tangentially relevant to desert road archaeology.⁵⁷ Nonetheless, scholars occasionally employ these incidental pieces of evidence to speculate about desert road itineraries. Guy Wagner noted that ostraca found at the Khargan oasis site of Dush were written by inhabitants of the Nile Valley towns (such as Tentyra, Coptos, Thebes, Hermonthis, Asphynis, Latopolis and Apollonos Ano) and conjectured that many of these locations were directly connected to Dush by desert roads; understandably, Wagner's rather grandiose claims cannot be easily accepted.⁵⁸ Other ostraca allude to the existence of as-yet-unknown desert road stations. It is known that a special desert road force (ἰχνους ἐρημοφυλακία, *ichnous eremophylakia*) levied a toll (διαπύλιον Ὀάσεως, *diapylon Oaseos*) on travellers going between Oxyrynchus and Bahariya.⁵⁹ Private letters of these road overseers suggested to Ursula Kaplony-Heckel that road supervisors manned an as-yet-unidentified outpost on the road stretch between the Oasis and the Nile Valley,⁶⁰ with ostraca recording desert watchmen asking their colleagues in Oxyrynchus for water and provisions.⁶¹ Finally, some ostraca directly comment upon the traffic on the desert roads, with those from al-Muweih (Krokodilo) recording the traffic on *Hodos Mysormitike*.⁶² One might also mention the Archive of Nikanor, a collection of eighty-eight ostraca that records bustling business operations of a family company that transported goods on the roads between the Nile Valley city of Coptos and the Red Sea ports of Myos Hormos and Berenike between 18 BCE and 69 CE.⁶³ Overall, since many of these documents remain unedited and unpublished,⁶⁴ it is possible that some of them could contain data that would further our understanding of the desert road transport in Roman Egypt.

1.4.2.4. Inscriptions

Of all types of epigraphical sources, inscriptions are perhaps of most relevance to desert road archaeology/studies. Unlike ostraca and papyri, they are found *in situ* and constitute first-hand pieces of evidence left in the desert road context by ancient inhabitants and travellers. Numerous official inscriptions found in the Egyptian deserts commemorate new building works and settlements; relevantly, some of these texts refer to ancient roads. At a local Nile Valley quarry at Gebel es-Sheikh al-Haridi, *strategos* Psais celebrated the site's opening in the 11th regnal year of Ptolemy XII (70/71 BCE) with an inscription dedicated to the gods of Panopolis (Akhmim); significantly, the inscription mentioned a road that linked the quarry to the village of Hibis in Kharga – probably, the modern Sohag road (section 6.6.1).⁶⁵ Other inscriptions commemorate the erection of desert road installations. Twinned Latin inscriptions at three Eastern Desert *praesidia* at Khashm al-Menih (Didimoi), Khawr al-Gir (Aphrodito), and Siket memorialise the building of roadside fortlets in 76/77 CE, erected under orders from the prefect of Egypt, Iulius Ursus (section 5.2.5).⁶⁶ However, the majority of Egyptian desert inscriptions were not official commemorative inscriptions, but rather signatures left by travellers wishing to mark their visit to a particular site. To enumerate but a few sites,

Graeco-Roman scribbles in the Eastern Desert were discovered in the Wadi Araba corridor (section 5.1.2),⁶⁷ on the rocks adjoining the road from Qena to Wadi Gawasis/Quei (section 5.2.3)⁶⁸ and in Wadi Hammamat (section 5.2.3).⁶⁹ The Western Desert also has its share of epigraphic material, with the so-called ‘good luck’ inscriptions, signatures, petitions to gods, or messages to future readers commonly found around Kharga, Dakhla, and in the vicinity of the Valley.⁷⁰ Inscriptions often appear at specific desert sites. Desert shrines abound in votive scribbles. Visitors to Pan shrines (*paneia*) in al-Buwaib and Wadi Menih left many personal inscriptions in hieroglyphics, Greek, Latin, and Arabic, with Latin autographs that could be dated engraved between 4 BCE and 35 CE (section 5.2.5).⁷¹ In a road context, shorter scribbles and drawings are often found near road stops and water sources. One such road stop is the Northern Outpost in the Khargan depression (section 6.5.3), where one finds a badly damaged Greek inscription, surrounded by images of feet and sandals (*plantae pedis*);⁷² these identity markings were either left by Old Kingdom soldiers manning these desolate outposts or by Graeco-Roman travellers resting near this sandstone outcrop.⁷³ Invaluable contextual markers of ancient desert traffic, inscriptions are easily datable to their era of origin and demonstrate beyond doubt which Egyptian desert roads were actually travelled in the Graeco-Roman period; as such, they are of crucial importance to desert road archaeology.

1.4.2.5. List of papyri and ostraca referenced in this book

Standard references to papyri and ostraca in this book adhere to the established convention set in the *Checklist of Editions of Greek, Latin, Demotic and Coptic Papyri, Ostraca and Tablets*.⁷⁴ The following list does not aim at complete internal consistency or complete referencing; instead, it provides the readers with titles of editions used and guides them to the *Checklist* for comprehensive bibliographical entries.

PAPYRI

P.Ryl. = *Catalogue of the Greek and Latin Papyri in the John Rylands Library, Manchester*.

P. von Scherling Inv. G 110, 141.4 364 = Noordegraaf 1938, 273–310.

P.Oxy. = *The Oxyrhynchus Papyri*.

P.Cair.Zen. = *Zenon Papyri, Catalogue général des antiquités égyptiennes du Musée du Caire*.

BGU = *Aegyptische Urkunden aus den Königlichen (later Staatlichen) Museen zu Berlin, Griechische Urkunden*.

SB = *Sammelbuch griechischer Urkunden aus Aegypten*.

P.Lond. = *Greek Papyri in the British Museum*.

P.Gen. = *Les Papyrus de Genève*.

Stud.Pal. (or SPP) = *Studien zur Palaeographie und Papyruskunde*.

P.Grenf. = *New Classical Fragments and Other Greek and Latin Papyri*.

P.Mich. = *Michigan Papyri*.

P.Fay. = *Fayum Towns and their Papyri*.

P.Achm. = *Les Papyrus grecs d'Achmîm à la Bibliothèque Nationale de Paris*.

P.Panop.Beatty = *Papyri from Panopolis in the Chester Beatty Library Dublin*.

INSCRIPTIONS

Koptos Tariff Inscription: *I. Portes du désert* 67 = Bernand 1984.

OSTRACA

O.Claud. = *Mons Claudianus. Ostraca graeca et latina.*

O.Wadi.Hamm. = SB XXII 15660–15700.

Ostraca grecs et latins de l'Wadi Fawakhir = Guéraud 1942, 141–196.

O.Krok. = *Ostraca de Krokodilô*, ed. H. Cuvigny.

O.Max. = Brun and Reddé 2003, 100–126.

O.Ber = *Documents from Berenike* = Bagnall, Helms *et al.* 2005 (Nos 136–257), 2000.

O. dem. Köln = Thissen 1975, 109–113, 1976, 63–77.

O.Petr. = ‘Ostraca in Prof. W.M. Flinders Petrie’s Collection at University College, London’, *O. Bodl I* 82–152.

O.Brüss. Berl. = *Au Temps ou on lisait le grec en Égypte.*

O.Bodl. = *Greek Ostraca in the Bodleian Library at Oxford and Various Other Collections.*

O.Douch. = *Les ostraca grecs de Douch.*

1.4.3. Archaeological evidence

1.4.3.1. Visible remains

Beyond literary and documentary pieces of evidence, archaeological evidence concerns desert roads *sensu stricto* – that is, linear structures and accompanying infrastructure, traces of which remain in the desert landscape. The most prized archaeological finds are road ruts. Ancient roads occasionally manifest in the landscape as parallel grooves worn into the surface of the desert by feet of countless humans and beasts of burden, at times distinct enough to be visible from space. Unable to be dated without contextual finds, surface grooves rarely survive in the modern era, especially with tracks of modern off-road vehicles crisscrossing and marring the surface of the desert. In the absence of grooves, courses of ancient roads can sometimes be conjectured thanks to contextual roadside finds (such as road installations and discarded/lost items), as ‘the mapping of these spots [...] enable[s] estimation of the approximate road course by interpolation into what characterises the “linear structure”’.⁷⁵ Desert road infrastructure dated to the Roman period comprises rest stops, wells, water harvesting/storage installations, and water/fodder supply stations; roadside architectural remains may include hilltop watchtowers, houses, and temporary rock shelters, whereas artefacts found are stone and metal utensils, coins, and, most importantly, pottery.⁷⁶ In contrast to road ruts, roadside installations and artefacts are often datable, with the especially important role of pottery containers, the shards of which line certain sections of Egyptian desert trails. Occasionally, archaeological surveys find no road ruts, no road installations, and no artefact finds to speak of, but a body of amassed textual/epigraphic evidence suggests an ancient road used to exist in the studied region. Such roads remain ‘silent’ in the archaeological context inasmuch as they are little more than hypothetical lines connecting two points in space.

Surveyors of desert roads tend to follow predictable procedures. First, the investigated area is examined via remote sensing for potentially interesting sites or visible road sections. Second, desert exploration teams carry out site extensive surveys that involve traversing the land, charting sites of interest through GPS systems, and photographing/dating surface finds. Third, promising sites undergo site intensive surveys, which entail drawing detailed architectural plans and elevations, geomagnetic surveys, and limited excavations. Finally, sites that yield the best material are (time permitting) fully excavated or secured against vandalism, to be excavated in the foreseeable future.⁷⁷

1.4.3.2. Remote sensing (satellite road detection)

One of the most important breakthroughs in the field of desert road archaeology was using satellite imaging techniques for the purposes of remote surveys. Extensive land surveys in harsh, hyper arid Egyptian climate pose special logistic difficulties, as to comb vast stretches of the waterless desert in search of faintly visible road remains demands plentiful water and fuel supplies and often yields no immediate results. The advent of satellite imaging enabled scholars to conduct initial extensive surveys from the comfort of their labs. Analyses of satellite images proved their optical resolution is high enough to capture traces of former roads, fields, and water harvesting installations. However, satellite imaging techniques also have certain limitations. Generally speaking, satellite data facilitate locating courses of roads worn in gravel (*serir*) and rocky (*hamada*) surfaces, whereas roads passing through shifting sands (*ergs*) are almost instantly obliterated and cannot be easily traced.⁷⁸ More importantly, all purported desert trails found on satellite images must be ground checked to ensure they were not misidentified, as natural features of the desert landscape can occasionally mirror man-made structures in appearance.

Studies applying satellite imaging techniques and GIS (geographic information systems) data to desert road archaeology have yielded interesting results, with several research pieces concerning such developments having been published in an edited volume entitled *Desert Road Archaeology in Ancient Egypt and Beyond* (eds Förster and Riemer 2013); below, I shortly summarise three projects that will be of importance to this book. First, Olaf Bubenzer and Andreas Bolten, for the very first time, pinpointed the exact run of Darb Tawil in the Western Desert by combining data obtained from satellite images, worldwide elevation models, and GPS-positioning systems; the authors of this study stressed that the Egyptian Limestone Plateau proved to be especially amenable to remote sensing methods due to its special Aeolian geology that helped to preserve ruts of the desert tracks.⁷⁹ Second, Kathryn Bard, Rodolfo Fattovich, and Andrea Manzo employed high resolution desert surface contour models of the Eastern Desert to ascertain which wadi beds constituted the gentlest and easiest trails – ‘the paths of the least resistance’ – while crossing from the Valley to the Red Sea and vice versa.⁸⁰ Third, another road that was charted through satellite imaging was Darb al-Deir, a Nile-hugging track that linked all Roman fortlets of the western Dodecaschoenus, the boundary land between Egypt and Meroe. In the 2000s, QuarryScapes teams led by Per Storemyr surveyed and charted the central section of

this track south of the modern Aswan International Airport; their thorough search of satellite images of the Aswan area revealed what they recognised as faint traces of Darb al-Deir between Dabod (ancient Parembolē) and Dehmit (ancient Chonetmouis). The road eventually disappears in the undulating landscape, but its general course up to that point suggested to the QuarryScapes team that it probably continued south towards Qertassi (ancient Tzitzis) and Kalabsha (ancient Talmis);⁸¹ in this case, satellite images greatly facilitated surveys in the rough and hilly terrain between the Gallaba Pediplain and the submerged portion of the Nile Valley. Hopefully, future developments in remote sensing techniques will allow us to chart desert roads that are too faint to be followed on contemporary satellite images.

Notes

- 1 Herodotus, *Histories* 2.5.
- 2 Occasionally, I refer to the so-called mid-Imperial or mid-Roman period, defined roughly as the late 2nd–early 3rd century CE, a time when the Roman rule in Egypt was undergoing a significant shift.
- 3 Förster and Riemer (ed.) 2013, 10; Riemer and Förster 2013, 19–20. For example, many scholars studying the Abu Shaʿar-Mons Claudianus area take for granted the existence of a trail that would link the quarry to the coast; on their survey maps, they perfunctorily mark a trail that originates near Mons Claudianus, crosses into Wadi Dalfa and strikes northwards for Abu Shaʿar. The trail is either drawn as is, marked in dotted line or not marked at all; importantly, map authors almost never discuss it in any detail (Murray 1925, Plate XI; Meredith 1952, 95; Sidebotham, Zitterkopf and Riley 1991, 574; Maxfield 1996, 10; Van der Veen and Hamilton-Dyer 1998, 102; Jackson 2002, xxvi; Adams 2007, xii; Sidebotham 2011, 126).
- 4 Darb al-Arbain, a road radiating south of Kharga, is a case in point. Notwithstanding its importance in the post-Roman period, it remains unknown whether its entire length was travelled in the Roman period; despite many authors affirming it had been so, no firm evidence has surfaced so far.
- 5 Good examples are Rohlf's 1875 study and Jennings-Bramly's 1902 description of a journey from Farafrā to Siwa.
- 6 For instance, Lisa Giddy plots on her map a putative road linking Wadi Natrun to Dashur which might or might not have existed (1987, 18, 36): the road itself is discussed in sections 6.2.1 and 6.2.2.
- 7 Morkot 1996, 90–93.
- 8 Jackson 2002, 156.
- 9 See sections 6.10.2 (Farafrā–Libya road), 6.10.3 (Kharga–Nubia road), and 6.10.4 (Dakhla–Gebel Uweināt road) for more detail on these putative trails.
- 10 However, it is not always so in the Sinai Peninsula, where the *Atlas* charts some roads (for example, Darb al-Hagg [discussed in section 4.5]) that, in all probability, were not walked in the Roman period. Since every map in the *Atlas* was produced by a different author, their accuracy varies.
- 11 *Pleiades* (<https://pleiades.stoa.org>) is a community-built open license gazetteer and chart of ancient places in Europe, Near East and Africa. *Trismegistos*, an interdisciplinary portal of papyrological and epigraphical resources on Egypt, the Nile valley and the ancient world *sensu largo* (800 BCE–800 CE), includes a database of toponyms of Roman Egypt (*Trismegistos Places*, www.trismegistos.org/geo/index.php, accessed on 8 July 2018), excerpted from Verreth's *A Survey of Toponyms in Egypt in the Graeco-Roman Period* (Trismegistos Online Publications, www.trismegistos.org/downloads/process.php?file=TOP_2.pdf, accessed on 8 July 2018).

- 12 These north Africa maps, a part of Perry-Castañeda Library Map Collection, are accessible online in the repository hosted at the University of Texas at Austin Libraries: http://legacy.lib.utexas.edu/maps/ams/north_africa/ (accessed on 8 July 2018).
- 13 Sidebotham, Hense and Nouwens 2008, xxii.
- 14 Herodotus, *Histories* 4.181–185.
- 15 Carpenter 1956, 231–242; Liverani 2000, 496–520.
- 16 Herodotus, *Histories* 3.5–10.
- 17 Herodotus, *Histories* 3.6–7.
- 18 Herodotus, *Histories* 3.26.
- 19 See sections 6.9.1.1 and 6.9.1.2 for roads from Siwa to Bahariya and Farafra.
- 20 Strabo, *Geography* 17.1.45.
- 21 Strabo, *Geography* 17.1.45.
- 22 Strabo, *Geography* 17.1.45; Ball 1942, 146, 158.
- 23 Strabo, *Geography* 16.4.4; Sidebotham, Hense and Nouwens 2008, 162–165; Sidebotham 2011, 41, 186–187.
- 24 Strabo, *Geography* 16.4.23, 17.1.25–26; Cohen 2006, 327–329.
- 25 Strabo, *Geography* 16.2.30, 16.4.18; Cohen 2006, 314–315.
- 26 Claudius Ptolemy, *Geography* 4.5; Pliny the Elder, *The Natural History* 6.168; Strabo, *Geography* 16.4.5.
- 27 Strabo, *Geography* 16.2.32; Figueras 2000, 207.
- 28 Strabo, *Geography* 17.1.42; Wagner 1987, 143; Guédon 2014, 149.
- 29 Pliny the Elder, *The Natural History* 6.26.102–104, 27.45; Strabo, *Geography* 17.1.45.; Ball 1942, 146, 158.
- 30 Claudius Ptolemy, *Geography* 4.5.8; Pliny the Elder, *The Natural History* 6.33.168; Strabo, *Geography* 16.4.5, 16.4.24, 16.4.45, 17.1.45; Sidebotham 2011, 184–186.
- 31 Pliny the Elder, *The Natural History* 6.166–167; Ball 1942, 82.
- 32 Strabo, *Geography* 1.3.4; Pliny the Elder, *The Natural History* 5.5.50; Kuhlmann 1998, 159.
- 33 Claudius Ptolemy, *Geography* 4.5; Pliny the Elder, *The Natural History* 6.168; Strabo, *Geography* 16.4.5.
- 34 Claudius Ptolemy, *Geography* 4.5.8; Meredith 1953, 103; Murray 1925, 142–143; Bagnall *et al.* 2006, 319–320; Sidebotham 2011, 128, 186.
- 35 Wagner 1987, 151; Jackson 2002, 255; Claudius Ptolemy, *Geography* 4.5.14.
- 36 Cuntz 1929, 23; Dilke 1985, 125–128; Sidebotham 2011, 158.
- 37 Ball 1942, 140; Figueras 2000, 48.
- 38 Murray 1925, 144; Ball 1942, 146.
- 39 Ball 1942, 138–140.
- 40 Ball 1942; Graeff 2005, 27.
- 41 Cuntz 1929, 23; Dilke 1985, 112–120; Talbert 2010; Sidebotham 2011, 157–158.
- 42 Ball 1942, 154; Figueras 2000, 46.
- 43 Ball 1942, 140.
- 44 Ball 1942, 158.
- 45 Ball 1942, 154.
- 46 Ball 1942, 155; Graeff 2005, 27.
- 47 Ball 1942, 104–105.
- 48 Before 1989, papyri were largely considered to be unimportant at best and misleading at worst (Finley 1985, 35; Adams 2007, 9).
- 49 Adams 2007, 10.
- 50 Adams 2007, 9.
- 51 Adams 2007, 9–10.

- 52 For instance, several preserved papyri refer to good shipments between Bahariya and Fayum (P. Grenf. II.50; BGU 2308; BGU 697; P. Fay. 68 BL I 130), but they offer no information on the road travelled.
- 53 Many of those papyri refer to the coastal road leading from the northeastern Egypt to Palestine and beyond (see section 4.1.2). Consider Theophanes' Archive (P. Ryl. 616–651; 317/324 CE), a personal log of a civil servant from Hermopolis Magna who travelled to Syrian Antioch and back, carefully recording road stops and intervals between them (Roberts and Turner 1952, 123–126; Figueras 2000, 45–46; Matthews 2006; Choat 2009, 41–75). Also interesting is a 5th-century papyrus (P. von Scherling Inv. G 110, 141.4 364) from Akhmim (Panopolis) that records several locations along the road leading from Egypt to Palestine (Noordegraaf 1938, 273–310).
- 54 Adams 2007, 235–237. Administrative papyri written in Bahariya and found in Oxyrynchus demonstrate that the latter city oversaw the oasis district and its trade (P. Oxy. 12.1439 (70 CE); 42.3033 (45–47 CE), 50.3569 (282 CE), 60.4071 (241–244 CE?). Similarly, a list of Thebaid towns compiled in 239 BCE (Wagner 1987, 142, n. 2; SB 4 7403, line 30) mentions Abydos next to Hibis in Kharga, the pairing of these sites cited by Wagner as evidence for a direct road connection.
- 55 For example, a 3rd century CE papyrus found at Ahhmim (ancient Panopolis) refers to ὀρεοφύλακες ὁδοῦ Ὁάσεως, 'overseers of the Oasis Road' who guarded the trail linking Panopolis to Kharga (Collart 1931, 69; Wagner 1987, 141; P. Achmim 7, BN135B2, line 36)
- 56 Adams 2007, 226.
- 57 Bingen *et al.* (eds) 1992, 1997; Cuvigny (ed.) 2000; Adams 2007, 198. *O. Claud.* I–IV = Bülow-Jacobsen (ed.) 2009. Other important collections of the Eastern Desert ostraca were found at Wadi Hammamat (*O. Wadi Hamm.* = Kayser 1993, 111–156), Wadi Fawakhir (*Ostraca grecs et latins de l'Wadi Fawakhir* = Guéraud 1942, 141–196); al-Muweih / Krokodilo (*O. Krok.* = Cuvigny 2005; Brun 2003a, 77–79, 83–90); al-Zerqah / Maximianon (*O. Max.* = Bülow-Jacobsen *et al.* 1994, 27–42) and Berenike (*O. Ber.* I–II = Bagnall *et al.* 2000, 2005 (nos 136–257), see also Adams 2007, 225–234).
- 58 Wagner 1987, 143 n. 7, 386.
- 59 Wagner 1987, 147–148; P. Oxy. 12.1439 (70 CE).
- 60 Kaplony-Heckel 1994, 229–238; Thissen 2013, 391–397.
- 61 For instance, see *O. dem.* Köln 38, 78, 163, 219, 286 (Thissen 2013).
- 62 Brun 2003a, 77–79, 83–90; *O. Krok.* = Cuvigny 2005; also see Zitterkopf and Sidebotham 1989, 173, 178.
- 63 *O. Petr.* 220–304; *O. Brüß.* Berl. 7; *O. Bodl.* II 1969–1971. For discussion and commentary on the Nikanor Archive, see Fuks 1951, 207–215; Sidebotham 1986, 83–92; Ruffing 1993, 1–26; Young 2001, 57; Adams 2007, 221–225.
- 64 Adams 2007, 198.
- 65 Spiegelberg 1914, 68; Wagner 1987, 142.
- 66 Meredith 1953, 99 n.1; 1952, 95 (fig. 1); Sidebotham and Zitterkopf 1995, 48; Bagnall, Bülow-Jacobsen and Cuvigny 2001, 325–333; Sidebotham, Hense and Nouwens 2008, 250, 336, 355, 357–358, 360.
- 67 Abd El-Raziq *et al.* 2002, 1–2, 68–71.
- 68 Harrell *et al.* 2006, 129–130; Graeff 2005, 151; Murray 1925, 146.
- 69 Brun 2003g, 187–206; Sidebotham 2011, 24, 143. See section 5.2.4.
- 70 Foertmeyer 1989, 83; Rossi and Ikram 2002, 148. For other examples of such inscriptions, see Wagner 1987, 33 no. 34, 34 no. 37, 36 nos 45, 48, 41 no. 61, 54 no. 7, 59 no. 1.
- 71 Fournet 1995, 206–208; Sidebotham and Zitterkopf 1995, 48, 51; De Romanis 1996, 203–17; Colin 1998, 92–114; Cuvigny *et al.* 1999, 133–72; Cuvigny and Bülow-Jacobsen 2000, 243–244, 256; Sidebotham, Hense and Nouwens 2008, 342.
- 72 Ikram and Rossi 2002b, 149; 2013, 276; 2004, 76. Regrettably, the inscription text has not been published.

- 73 Kaper and Willems 2002, 85–86; Kuhlmann 2002, 278–283; Kaper 2009, 171.
- 74 Available at <http://papyri.info/docs/checklist>. The founding editors of the list are John F. Oates and William H. Willis. Other editors of the *Checklist* include Joshua D. Sosin, Roger S. Bagnall, James Cowey, Mark Depauw, Terry G. Wilfong, and Klaas A. Worp.
- 75 Riemer and Förster 2013, 34.
- 76 Riemer and Förster 2013, 56.
- 77 Förster and Riemer (ed.) 2013, 13.
- 78 Bubenzer and Bolten 2013, 62.
- 79 Bubenzer and Bolten 2013, 62, *passim*; also see section 6.5.2.
- 80 Bard *et al.* 2013, 549–552; Riemer and Förster 2013, 34.
- 81 Storemyr *et al.* 2013, 407, fig. 11, 408–410; also see section 6.8.4.

Road networks of Roman Egypt

2.1. Factors influencing road network structure in Roman Egypt

2.1.1. *Travel corridors: interactions between the desert landscape and human activities*

In the following sections, I consider differing landscapes of the Western and Eastern Desert and the Sinai Peninsula in relation to their conduciveness to desert travel. I also discuss what attracts humans to specific spots in the desert and fosters the development of desert road networks. To deepen our understanding of desert road networks in Roman Egypt, it should be discussed how one may analyse the available pieces of data according to a dominant research paradigm. The conservative approach to the desert travel research in ancient Egypt built on notions such as the ‘primacy of destination’ and ‘invisible nomads’.¹ The journey was conceptualised as a movement from point A to point B, with no traces left between the trail’s termini. Accordingly, conservative desert road research chiefly drew its data from sources that record travel starting points and destinations or distances between them – for instance, sale receipts/contracts recorded on papyri/ostraca or lists of road stations in itineraries – but disregards data concerning the roadside sites.² The reductive A–B approach was mirrored by traditional archaeological approaches. In the spirit of site-oriented archaeology, a conservative surveyor of desert trails surveyed and excavated major sites near the trail’s termini, occasionally examining other settlements between these two points; in contrast, the landscape between the sites was seen as empty and archaeologically inert. At times, archaeological teams conducted desert area surveys, plotting and surveying groups of sites bearing traces of human habitation; nonetheless, usually, no effort was made to track human movements in the desert landscape between the surveyed sites.³

At the beginning of the 21st century, desert road studies underwent several paradigm shifts, with the focus progressively moving from three-dimensional site and area studies to analyses of two-dimensional linear structures in the desert landscape.⁴ New bodies of evidence relevant to ancient desert travel have been collected and considered. Surveys in the Egyptian deserts noted and plotted ruts worn in the surface of the desert by feet of countless animals following ancient trails, some of them discovered through satellite imaging and later confirmed via ground checks.⁵ Other surveyors examined the deserts of Egypt area-by-area, cataloguing roadside installations (well shafts, traveller shelters, road stations and forts), artefacts (mainly pottery mounds/assemblages) and inscriptions left by passers-by who wished to commemorate their presence.⁶ These novel research methods have since been categorised, summarised, and explored in detail in a single work. In 2013, Heinrich-Barth-Institute at the University of Cologne published an edited volume entitled *Desert Road Archaeology in Ancient Egypt and Beyond*, a recommended introductory textbook to the field of desert road archaeology and a state-of-the-art survey of ongoing and planned research in the field.

Thanks to new developments in the desert road research, it is now possible to devise a research approach that would simultaneously consider the linear and nodular nature of desert trails. Such pathways can be conceptualised as linear structures that follow expedient routes in the desert landscape, passing through at least two – or possibly more – functional nodes attracting human traffic, including water sources, farmlands, mines/quarries, trade hubs, military installations, or actual settlements.⁷ Local terrain topographies shape runs of trails between nodes, with pathways commonly discernible in the archaeological desert landscape through finds of ‘portables’ (objects lost or deposited during a journey) and ‘fixtures’ (immovable structures erected in the road environment).⁸ Whenever possible, the actual run of the road is mapped according to preserved traces of ancient ruts worn into the surface of the desert. If such traces are nowhere to be found, roads are charted in a form of the most convenient connections between two neighbouring roadside sites expected to adjoin the same trail. Such an approach blurs the boundaries between the traditional roadside site archaeology and the desert road landscape studies. Roads become traffic corridors, conduits through which traffic flows between a series of nodes, usually leaving behind tangible traces in the desert.

2.1.2. Landscape factors – terrain topography/geology

With regard to topography and surface cover, the desert is a mosaic of various stony and sandy plains, sand seas and high dune trains, rocky highlands, escarpments, depressions, deep valleys, and undulating hilly areas. Although waterless in most parts, groundwater charges wells and spring mounds at some places, and spots of vegetation survive in some favourable refuges. This spotty distribution of landscape elements created a diversified challenge to the people who crossed the deserts and shaped the patterns of road construction and travel.⁹

In light of easily discernible differences between the landscape of the Eastern and Western Desert, it should be considered how changes in topography and surface cover influence

the desert travel in Roman Egypt. Certain general statements remain true in all periods and all areas of Egyptian deserts. Generally speaking, caravans prefer to tread on a level terrain, as traversing slopes and escarpments demands a great deal of effort. As for the surface cover, donkey caravans gravitate towards rocky surfaces, where donkeys can wear down their ever-growing hooves, whereas camel expeditions choose sandier strips to spare delicate feet of these ungulates.¹⁰ However, the Eastern and Western Deserts differ much in their surface cover and general topography. More specific considerations pertaining to travel in these landscapes are discussed in two following sections.

2.1.2.1. Eastern Desert

The rugged, mountainous Eastern Desert stretches between the Nile Valley in the west and the Red Sea in the east, with the adjoining Sinai Peninsula separated by the narrow Gulf of Suez. Atbai Mountains soar in the central and eastern part of the desert, tumbling down to the Red Sea coastal plain; in the west, the mountains fall to the rolling expanse of hilly plateaus that eventually meet the edge of the Nile Valley.¹¹ Ancient Egyptians have walked the Eastern Desert since times immemorial, its main attracting factors being substantial mineral resources to be exploited and exotic goods to be imported via the Red Sea ports.

Travellers in the Eastern Desert would find certain features of this area facilitate their crossings. Due to its high elevation and specific geological make-up, the Eastern Desert attracts and stores somewhat more water than its western neighbour. Groundwater is often found at a shallow depth and can be withdrawn by digging makeshift wells in the wadi beds.¹² Unsurprisingly, traffic in the Eastern Desert tends to follow dry beds of rivers that once flowed from the chain of peaks in the centre to the Red Sea or the Nile Valley. Ancient trails crossed the desert from west to east, navigating well-watered wadi beds where wells and waterholes could be found at regular intervals to ensure proper watering of beasts of burden. Experimental models proposed by Bard, Fattovich and Manzo strongly suggest a maximum distance between watering points should be no more than 80 kilometres, an easily fulfilled requirement for most of the Eastern Desert tracks.¹³

2.1.2.2. Sinai Peninsula

A geologically diverse region, the Sinai Peninsula encompasses sand (*erg*), gravel (*serir*), and rock (*hamada*) desert. At the northern coast, a broad crescent of sands rises from the Suez Canal and curves north-eastward across the coastal plain as far as Beersheba in Israel.¹⁴ The region between the Delta and the city of Rafa, once known in Arabic as Gifar (Djifar),¹⁵ abounds in shifting sands of the *erg* type.¹⁶ Its most distinctive landform and greatest body of water is the brackish lake Bardawil, separated from the Mediterranean by a narrow, broken sandspit. At the coastal plain near modern al-Arish one finds the mouth of eponymous Wadi al-Arish, an intermittent river flowing from the central part of the Sinai, its basin dominated by the desolate, undulating al-Tih Plateau, which rises from the coastal plain and extends southwards until it meets the crystalline mountain ranges of southern Sinai.¹⁷ It is preceded by the slightly lower

massifs of Gebel Maghara, Gebel Yelleg, and Gebel Hallal,¹⁸ the sandy hollow between them (Wadi Maghara) constituting a natural secondary traffic corridor between Egypt and the Palestinian interior. Tih, 'the Desert of Wandering', has little plant life and water. A monotonous, sun-baked plain of dark gravel, it rises steadily to the south until it falls sharply into the system of valleys that divides it from the mountainous Sinai Massif.¹⁹ Eastern slopes of al-Tih descend gently onto the Suez Foreshore,²⁰ a sandy coastal plain between Suez and Wadi Gharandal that resembles the northern coastal plain and has similar problems with potable water supply. In the rugged, broken Dividing Valleys south of al-Tih, the Egyptian prospecting enterprise once founded a series of mines and smelters concentrated around Serabit al-Khadim and Plain of Markha.²¹ Further to the south rises the Sinai Massif, a great maze of winding wadis and sprawling mountains that attracts much traffic in the region,²² partly due to its symbolic significance and partly due to its hydrological situation. In contrast to arid al-Tih or sand-choked Suez Foreshore and coastal Dune Sheet, water is easier to come by in the crystalline mountain plateaus and gullies of the southern Sinai. Mountain wells in the wadi beds draw water from well-filtered and fresh groundwater; moreover, intermittently flowing highland wadis tend to accumulate moisture under their beds, providing resourceful travellers and their animals with adequate amounts of liquids.²³

2.1.2.3. Western Desert

In contrast to the Eastern Desert, the Western Desert of Egypt comprises a staggering variety of landscapes. In the north, the Mediterranean coast between Sallum and the Delta rises towards the rolling Marmarican plateau that eventually plummets sharply into the forbidding Qattara Depression. In the extreme northwestern portion of the depression close to the Libyan border, one finds isolated Siwa Oasis;²⁴ on its opposite end, the flats rise towards the Nile Valley in the direction of the alkali lakes of Wadi Natrun. Further south, the Qattara Depression gently ascends towards the Egyptian Limestone Plateau, with its 'Eocene limestone formations rising up to more than 500 m above sea level and dropping down to the oases' depressions along escarpments which are up to 400 m high'.²⁵

The four major oases (Bahariya, Farafra, Dakhla, and Kharga) arc across the desert and flank the Plateau from the west, southwest, and south; numerous desert trails transverse the Plateau to connect them to the Nile Valley in the east. The tableland surface they cross is covered partly by rocky outcrops (*hamada*), partly by narrow bands of gravel (*serir*), and partly by shifting sands (*erg*).²⁶ The most important (yet narrow) dune chain, Ghard Abu Muhariq, stretches through the Limestone Plateau from an area north of Bahariya to the northern reaches of Kharga, hindering travel between the Nile Valley and the oases. Larger dune chains stretch to the southwest of the oases, seamlessly blending into the Great Sand Sea that flanks Egypt from the west and protects it from all but the most desperate invaders. In the remote southwest corner of Egypt, the featureless plain soars towards the Gilf Kebir plateau and the Gebel Uweinat mountain range,²⁷ the latter area famous for a local hieroglyphic

inscription that mentions the fabled lands of Yam and Tekhebet with which Egyptians have intermittently traded.²⁸ Southeast of Kharga, the terrain rises again towards the winding Sinn al-Kaddab escarpment, where the land plummets again to meet the Gallaba Pediplain that stretches eastwards towards the Nile Valley.²⁹ The local groundwater basins beneath fragmented limestone uplands of Lower Nubia feed a group of brackish waterholes, known as the Nubian oases, among which one may enumerate Kurkur, Dunqul, Bir Nakheila, Bir Kiseiba, al-Shabb, and Selima, with many of these watering points populated at one point or another in the Dynastic period.³⁰

Unlike the Eastern Desert, the Western Desert terrain poses difficulties in terms of water management and trail navigation. Groundwater can be withdrawn at the low-lying oases, but there are very few wells at the elevated Limestone Plateau because shafts often cannot reach deep enough to access the Aeolian deposits that feed the oases.³¹ Trails of the Eastern Desert lead through easily-followed dry riverbeds; in contrast, navigating the rolling plains and gravel flats of the Western Desert demands special effort. Complex, multidirectional road networks of the Western Desert adapted to the demanding terrain, with travellers in the Western Desert having to rely on road markers, such as cairns, stelae, pottery scatters, and extant trail infrastructure.

2.1.3. Human factor – network nodes and attractants

Human activities in the inhospitable desert environment tend to cluster around specific sites of interest, often connected to sources of water, food, and resources. Desert trails naturally gravitate towards and pass through such sites, with watering points being of special importance to all who travel in the desert. The following sections discuss six types of desert activity nodes that, in my view, formed the backbone of any desert road network in Roman Egypt.

2.1.3.1. Water nodes

No Saharan route was a road or even a track in any recognised sense, but often merely a general line of travel between two points (...) But vital to any route was the availability of water at suitable intervals, and enough of it, to meet the urgent, often desperate, thirst of an arriving caravan, possibly of hundreds of people and animals.³²

The most important factor influencing the emergence of travel nodes in the Egyptian desert is the presence or absence of water. Deserts of Egypt remain some of the most arid areas on Earth. In the Western Desert, even the sites on the Mediterranean coast rarely get more than 100 mm of annual rainfall; inland sites of Central Marmarica Plateau can receive 35 mm/year or less, with hyper arid Siwa receiving merely 8 mm/year and the Limestone Plateau less than 5 mm/year.³³ In the Eastern Desert, precipitation amount varies from ca. 100 mm/year on the Northern Sinai coast to 28 mm/year at Eilat to 5 mm/year at Quseir, with mountain ranges in the Eastern Desert receiving slightly more precipitation (ca. 25 mm/year).³⁴ The desert groundwater reservoirs are periodically recharged by sudden torrential downpours (*seyul*) that flood the parched landscape and temporarily turn the desert into a blooming garden;

however, such deluges are relatively rare.³⁵ In light of the fact that the estimated mean annual evaporation rate in the Eastern Desert amounts to a staggering 2500 mm/year,³⁶ it is obvious why procurement and storage of potable water is of utmost importance in the deserts of Egypt. Importantly, differences in the geological make-up of the Eastern and Western Desert translate into differences in their water storage potential, with jagged, crystalline mountain chains of the Eastern Desert trapping and storing moisture better than the limestone flats of the Western Desert. In the Eastern Desert, one can dig into any wadi bed and expect to find water at a relatively shallow depth, although its quality may vary.³⁷ In contrast, rain falling upon the Limestone Plateau in the Western Desert readily percolates through the calcareous soil and accumulates deep below the surface above the impermeable bedrock; at oases, deep indentations in the flat expanse of the Plateau, one may tap into this otherwise inaccessible subterranean water reservoir.³⁸

Generally, areas devoid of water rarely bear traces of human activities – and even if they do, the said activities were often transitory and/or limited in scope or nature; in contrast, most material secured from the desert sites in Egypt was found in the vicinity of water sources, such as springs or wells. Therefore, water-bearing areas form the most elementary class of nodes, upon which almost all other types are superimposed. Without a local source of water, agriculture is impossible and prospecting, trade, and military activities experience major logistic and practical difficulties. Nonetheless, this is not to say that waterless areas in the Egyptian deserts cannot support humans. Water has been occasionally transported for long distances over the desert to supply remote desert communities that had no access to local potable water sources;³⁹ however, maintenance of such water supply lines necessitates coordinated use of manpower and resources and incurs considerable costs. Interestingly, few discovered desert road installations entirely depended on external water sources.⁴⁰ In fact, wells were built whenever possible to defray some of the upkeep costs. On the other hand, many natural sources of water in the desert have been intermittently enhanced by humans. One might mention clearing of sand-choked springs, so they may flow again. As a result, almost all water nodes bear traces of human augmentation.

Importantly, not all sources of water in the Egyptian deserts can support agriculture or larger sedentary human communities. Many authorities on the deserts of Egypt do not distinguish between an oasis *sensu lato* and an oasis *sensu stricto*. In contrast, I believe a distinction should be made between a true oasis and a waterhole. In Egypt, oases *sensu stricto* comprise depressions puncturing the waterless expanse of the Limestone Plateau in the Western Desert, their springs tapping into abundant, sweet Aeolian water deposits underneath the limestone layers.⁴¹ As such, genuine oases can support large permanent communities and sustain agriculture. One may include in their number Siwa, Bahariya, Farafra, Dakhla, and Kharga Oases, with miniscule oases of the al-A'reg group also possibly qualifying.⁴² Contrarily, waterholes as a class encompass springs that primarily draw their water from shallow alluvial aquifers that depend on meagre precipitation percolating through the topmost layers of the

soil;⁴³ as such, they often yield brackish water and can run dry during droughts.⁴⁴ Accordingly, waterholes can sustain only a limited number of people and usually attract only transient groups of shepherds seeking pastures for their flocks. The oasis designation has been somewhat haphazardly assigned in literature: for instance, Selima Oasis in its current state is more properly classified as a waterhole. In this book, I follow the traditional naming patterns, with a caveat that not all ‘oases’ can support a permanent population.

2.1.3.2. Food (agricultural) nodes

In the Egyptian deserts, plots of land adjoining water sources usually can be cultivated, although whether the crops will thrive depends on many factors. I have distinguished between oases, having access to abundant water all year round, and waterholes, sustained by springs of variable output and water quality. Egyptian oases, tapping into abundant reservoirs of sweet water underneath the Limestone Plateau, from the very beginning could sustain extensive farmland and large permanent communities. In opposition, Egyptian waterholes today usually produce enough water to sustain pieces of grazing lands and copses of palm trees, but often are not enough for farmland;⁴⁵ as such, these desolate springs generally remain uninhabited in the modern period.

Nonetheless, local surveys demonstrated that many Egyptian waterholes had in fact been peopled in the Graeco-Roman period. On the trail between Farafra and Dakhla, one finds Bir Abu Minqar spring, where surveyors have noted two well shafts and two ruined brick buildings tentatively dated to the Roman period.⁴⁶ Given that one well would produce more than enough water for the site inhabitants and visiting caravans, it is probable that surplus water was used to irrigate local fields, traces of which regrettably have not been located. In turn, surveys undertaken by University of Viterbo teams in the Ain al-Wadi area (on the trail from Bahariya to Farafra) uncovered traces of small but thriving Roman farming communities that grew around local springs; to the best of my knowledge, to this day, they have not been excavated.⁴⁷

Roman occupation of sites previously thought to be unsuitable for farming compels one to re-evaluate the viability of ancient desert farming ventures. It is true that oases are naturally more suited for sustaining large-scale agriculture and, by extension, large human communities; nonetheless, it is also true that any parcel of the desert land with access to a subterranean aquifer may be turned into farmland, provided appropriate water harvesting-storage-distribution systems are in place.⁴⁸ Significantly, even water-abundant oases are far from agricultural self-sufficiency. Upkeep of watering systems requires funds, skilled manpower, and resources, whereas agricultural yields produced often peak at subpar or subsistence levels.⁴⁹ Indeed, it has been convincingly argued that an oasis as we understand it is an artificial construct. From the beginning of Egyptian history, springs located in fertile desert depressions were augmented with water harvesting and storage installations – not to increase agricultural yields, but to enable sustainable agriculture in the first place.⁵⁰ From the Persian period onwards, Egyptian oases augmented their aquifer-based water economy with rainfall water

harvested by extensive networks of underground aqueduct shafts (*qanats*).⁵¹ By the Roman period, many irrigation systems drew their water solely from *qanats* and not the springs, a development that fostered agriculture in areas previously thought to be too arid to sustain crops. In other words, oases and waterholes, differing in their baseline water outputs, tend to produce similar agricultural yields once water harvesting and distribution technologies are applied.

For the purposes of desert travel analysis, it should be stressed that water nodes (sites with springs, wells, water-bearing areas) tend to overlap with food nodes (cultivated, food-producing areas). For instance, *qanats* were not built in places where there were no springs, as quantities of water obtained from rainfall harvesting in arid Egyptian deserts could never rival the output of springs and wells. As a rule, agricultural and rural development occurs at or near water nodes, with some important exceptions; certain water nodes remain little more than waterholes, visited only by passing caravans. In other words, water nodes are a primary class of nodes upon which almost all others (including food nodes) are superimposed. Every caravan sooner or later had to pass through water nodes to replenish their water stores; in contrast, food and fodder for caravan could either be carried or obtained along the way, although – for obvious reasons – it was preferable to carry as little as possible.

2.1.3.3. Quarry/mining nodes – mineral resources of the desert

Differences in geology of the Western and Eastern Deserts result in different types of mineral resources available for exploitation in each area. In contrast to substantial and diverse mineral resources found in the rugged mountains of the Eastern Desert, the Western Desert has fewer types of exploitable resources,⁵² but what it lacks in mineral diversity, it makes up for in their worth. Alkaline lakes of Wadi Natrun in the northern part of the Western Desert abound in natron, an astringent mineral made up of hydrated sodium carbonate and bicarbonate. Of an immense value to Egyptians, natron was used in mummification, medicine, and soap- and glassmaking.⁵³ In the desert plains around Dakhla, Kharga, and al-Shabb, one will find deposits of alum (hydrated potassium aluminium sulfate), used as a mordant in textile dyeing; in addition, some alum deposits around Dakhla and Kharga contain natural admixtures of cobalt salts and added bluish hue when mixed into certain types of Egyptian glass.⁵⁴ Flat pans around Siwa and periodically flooded lagoons at the shores of the Mediterranean readily evaporate in the hot climate, leaving behind thick residues of salt to be gathered and traded by local inhabitants.⁵⁵ Furthermore, calcareous plateaus and ridges of the Western Desert can be quarried for limestone. The narrow Taenia ridge, a strip of land separating Mareotic Lake from the Mediterranean, was quarried in the Roman period for local oolitic limestone;⁵⁶ in turn, rugged hills that mark the western edge of the Nile Valley between Luxor and Cairo abound in Eocene limestones.⁵⁷ In sum, resources of the Western Desert may be classified as evaporite and carbonate sedimentary rocks, deposited by sedimentation and evaporation processes.

As much as the Western Desert is made up of layered sedimentary rocks, the craggy Eastern Desert is made up of mineral-rich igneous and metamorphic rocks. Understandably, the land experienced a flurry of quarrying and mining activities in the Roman period⁵⁸ as prospectors surveyed numerous mountain sites, searching for valuable stones and metals.⁵⁹ Roman rock quarries tended to cluster around several key areas.⁶⁰ At Mons Porphyrites, Roman quarrymen hewed columns and blocks of greatly coveted imperial porphyry,⁶¹ whereas works at Umm Huyut⁶² and Mons Claudianus⁶³ provided blocks of granodiorite and tonalite gneiss. Neighbouring quarries at Domitiane⁶⁴ and Tiberiane⁶⁵ yielded quartz diorite. Further south, in Wadi Maghrabiya⁶⁶ and at Semna (Mons Ophiates),⁶⁷ one finds Roman gabbro quarries. Persou facilities in Wadi Hammamat quarried different varieties of sandstone/siltstone.⁶⁸ Finally, at Gebel Rokham, quarrymen tapped into a thin marble vein, a mineral exceedingly rare in the borders of Egypt.⁶⁹

Unlike quarries, Eastern Desert mines did not cluster around key deposits but were spread haphazardly over the hills and ridges to tap into local minor veins. In the northern section of the Eastern Desert, tell-tale green malachite stains on the rocks herald rich copper veins found underneath the northern slopes of Wadi Araba.⁷⁰ In the Mons Smaragdus region, miners extracted beryls and emeralds,⁷¹ whereas Roman mines at Wadi al-Hudi⁷² and Wadi Abu Diyeiba⁷³ yielded amethysts. Interestingly, the general increase in prospecting and mining activity in the Eastern Desert under the Romans does not include gold-mining; out of hundreds of gold-mining sites in the Eastern Desert, very few (such as Bir Umm el-Fawakhir on the Wadi Hammamat road) were still occupied in the Roman period.⁷⁴ For instance, in the auriferous areas north of Wadi Hammamat, one finds several Ptolemaic and Early Roman gold mining installations (Der Gidami;⁷⁵ Bir Sirbakis;⁷⁶ abandoned Ptolemaic gold mining installations at Bukhalug;⁷⁷ Roman (?) gold mining installations at Wadi Umm Jariyan;⁷⁸ and the old gold mine at Saqia⁷⁹); by the late 1st century CE, this mining region lost much of its former significance, with the mines having been partially abandoned.⁸⁰ The same post-Ptolemaic decline in gold-mining activities may be observed in Wadi Hammamat⁸¹ and at the gold mining complexes in Samut⁸² and Barramiya.⁸³ Seeking to explain this decline, Rosemarie and Dietrich Klemm hypothesised that increasing pressures from nomadic Blemmyes made gold-mining a laborious and unprofitable venture in the Roman period.⁸⁴ In contrast to stone block transports, gold caravans were prone to being robbed and had to be heavily secured. As gold deposits do not occur in clusters but are dispersed all over the desert, it would be impossible to build a single series of military outposts to patrol their movement; however, guarding every mine with itinerant patrols would probably be prohibitively expensive, costs overrunning the expected profits from gold trade. In light of these facts, it is easy to understand why gold deposits of the Eastern Desert would only be sporadically mined in the Roman period.

In terms of desert travel economy and human attractants, quarry/mining nodes form the first class of sites that do not strictly depend on local food and water resources

and can appear independently from them. Rarely would the mineral resources of the desert be easily accessible from well-watered areas;⁸⁵ often, quarrying and mining activities require providing the workers with water, food, and shelter. Food is usually imported, as mineral-rich sites of the Eastern Desert are not suitable for extensive on-site farming,⁸⁶ whereas shelter and wells would usually be built from scratch. Unique hydrological conditions of the Eastern Desert favour well-building activities. Almost all wadi sites can support wells, provided the shafts are deep enough. Hence, presence of mineral resources often spurs development of water nodes, vital for desert travel. Areas that originally were not conducive to travel become more traveller-friendly due to the appearance of quarry/mining nodes.

2.1.3.4. Trade (food supply/local/long distance) nodes

Another class of nodes comprises sites important to the desert trade, spots through which goods passed on their way from a producer to a purchaser. Recent studies in trans-Saharan connectivity indicate ancient and pre-modern Saharan trade networks encompassed short-, medium- and long-distance connections between local trade hubs, with minor communities and resting stations placed along the way in the desert.⁸⁷ Less tangible than previous types of nodes, such sites form supply-demand lines that criss-cross the desert landscape. Resources produced at food and mineral nodes in the desert are transported through a series of trade nodes to their destinations in the Nile Valley and beyond.⁸⁸

At their most rudimentary level, trade networks facilitated essential circulation of agricultural surpluses between different productivity zones in the desert. With highly variable yields of local oasis agriculture, prosperity in one region inevitably coincided with famine in another. Local foodstuff trade somewhat redressed such inequalities, siphoning off agricultural surpluses to less prosperous communities.⁸⁹ Distinguishing features of desert foodstuff trade in the Antiquity include: 1) focus on high bulk/low value commodities, 2) perishability of transported goods and, consequently, 3) relatively high volume and frequency of desert caravans transporting foodstuffs.⁹⁰ The rapid agricultural development of oases and smaller waterholes in the Western Desert under the Romans reveals that trading in food surpluses was crucial for the economy of desert communities, with most of Dakhla and Kharga's produce exported to the Valley.⁹¹ One must also note that oases were a vital part of the supply system that transported state-requisitioned grain from Egypt to the city of Rome.⁹² In contrast, many Eastern Desert communities (such as Berenike) did not grow their own crops and were heavily reliant on provisions supplied from the Nile Valley.⁹³ In sum, foodstuff transport (both local and trans-regional) to and from desert communities of Roman Egypt was the driving force behind many a desert caravan that crossed the Western and Eastern Desert.

At the higher level of organisation, desert trade nodes facilitated transport of mineral resources and luxury goods into (and out of) the Nile Valley. Not all types of resources were imported into the Egypt proper. State-owned mines and quarries in

the Eastern Desert sent convoyed shipments of its coveted mineral resources (such as beryls, porphyry, and gold) into the Valley, whereas salt, limestone, natron, and alum found in the Western Desert could be used locally, traded with other oases, or exported from the Valley. Luxury goods travelled both ways through the Eastern Desert, with Roman commodities exchanged for African and Indian wares in the ports of the Red Sea and Indian Ocean. Mineral resources and luxury goods were mostly nonperishable low-medium bulk/high value commodities in danger of being stolen by desert nomads.⁹⁴ The need to protect the valuable cargo of the desert caravans from raids was the impetus behind the appearance of yet another class of nodes (military installations).

2.1.3.5. Military nodes

The emergence of food, mineral, and trade nodes eventually brought about the appearance of military nodes, that is, complexes of military installations designed to protect civilians from desert raiders. What brought about the appearance of the desert raiders was the geographical proximity of pockets of unprecedented agricultural growth and areas of great scarcity. The intra-regional foodstuff trade system, based on peaceful cooperation, had its negative counterpart. Some peoples, not content with what they could get through trade, secured their living through attacking other tribes to eke out a bare existence in the inhospitable desert.⁹⁵ Under the Romans, many remote rural areas of the Egyptian desert experienced a period of rapid development, and their wealth attracted the attention of many desert nomads; consequently, military installations were erected and manned to protect oases from raids.

Certain discernible regularities may be observed in the design and functioning of Rome's desert frontier installations in Egypt. Similarly to trade nodes, military nodes functioned as groups of outposts, usually placed either at regular intervals along the wadi bed trail (typical for Eastern Desert) or at the borders of cultivation, near the trail's termini (typical for the Western Desert). Furthermore, Roman forts were often built in places with secure water supply. Finally, forts in the desert tend to follow water sources instead of stretching ahead in straight lines;⁹⁶ in that aspect, they strongly resemble desert caravans, leapfrogging from one water source to another.

In the Eastern Desert, military installations were placed at regular intervals along the wadi beds in the desert. Protecting civilian travellers and state transports, they provided caravans with water, food, and shelter.⁹⁷ In the Western Desert, military fortifications guarded the oases from within and without, with outermost garrisons placed in the vicinity of passes that gave access to the oases.⁹⁸ Significantly, few Western Desert garrisons were located in the desert. Instead, remote desert trails were patrolled by civilian liturgists (*ὄρεοφύλακες/έρημοφύλακες, oreophylakes/eremophylakes*) sent out from the cities or by soldiers stationed at the forts.⁹⁹ The majority of soldiers serving in the desert probably belonged to patrolling auxiliary mounted units, such as *dromedarii* and *equites*, detached from larger Nile Valley garrisons.¹⁰⁰ Their military presence in the desert might have been seasonal, with

many outposts manned or abandoned on demand. It has been postulated that, during quieter periods, desert garrisons were down to a skeleton staff, with additional forces dispatched only when caravans with valuable goods crossed the desert or large imperial works demanding marble were in progress.¹⁰¹ Limiting the time soldiers spent in the desert might have been an attempt to make the stay more bearable. We know soldiers who were assigned to live in that inhospitable, dreary environment had to endure it for at least three and occasionally up to eighteen months.¹⁰² As it is, military nodes form the only class of nodes that could periodically disappear and reappear in favourable conditions.

2.1.3.6. Settlement nodes

Settlement nodes simultaneously form one of the commonest classes of desert nodes and the pinnacle of their development. As a rule, desert settlements are superimposed on other types of nodes. They usually have access to abundant water, grow their own food, engage in local/trans-regional trade, and occasionally host protective military installations; unsurprisingly, they form natural entry and exit points for desert trail networks. Of particular interest to this study is the rarest type of settlement nodes: permanent human communities without access to water sources or farmland. As mentioned in preceding sections on food and trade nodes, oasis/waterhole communities are rarely – if ever – self-sufficient and have to engage in local foodstuff trade to survive in case of drought or famine; nonetheless, the majority of such communities have access to a water source and produce at least a share of consumed crops.

Still, in Roman Egypt, one occasionally encounters atypical desert communities that survive without agriculture or water. Quarrying and mining communities in the Eastern Desert qualify as population centres that have little water and rely entirely on imports from riparian agricultural communities; nonetheless, one might argue that miners and quarrymen's villages, impressive as they might be, were founded with the express purpose of harvesting mineral resources and do not function as genuine permanent communities. More interestingly, one might mention four Roman colonies in Egypt (Gerrha, Pentaschoenum, Casium, and Ostracine) situated on a windswept Sirbonitic Spit between the Mediterranean Sea and the Lake Bardawil. Established to control the strategic road along the Mediterranean coast and provide travellers with water and shelter,¹⁰³ these four foundations prove the Roman administration could successfully improve the existing road infrastructure in a region extremely unconducive to desert transport. Since their groundwater was made brackish due to saline intrusions from the neighbouring sea and their sandy soil turned barren from sea salt, the Sirbonitic communities were dependent on external provisions, and probably even in the 1st century CE, they had to obtain their water from neighbouring communities;¹⁰⁴ nonetheless, they survived if not thrived, demonstrating that even this hostile desert environment could be settled in specific circumstances.

2.2. Dense and sparse zones in the Egyptian deserts under the Roman influence

2.2.1. Desert connectedness studies

No desert oasis, however lonely and unimportant, was isolated from the lines of trade. To describe the commercial system [...] in terms of particular routes and specializing groups is certainly to oversimplify it, for caravans, large and small, went everywhere that people lived.¹⁰⁵

Research in the ancient Saharan trade, a controversial and intriguing field of study,¹⁰⁶ gained impetus in the 2000s, after the publication of *The Corrupting Sea* by Peregrine Horden and Nicholas Purcell. Adopting the ecological perspective, authors of this seminal work highlighted the innate ecological instability of Mediterranean communities, with unbalanced food and resource economies necessitating regional and trans-regional trade. In their view, the emergent Mediterranean became a space of connectedness – a decentralised collective of local microeconomies pulled together by a network of trade links that ensured their continued existence.¹⁰⁷ Other historians welcomed the *bonne-à-penser* notion of a vast inhospitable area that sustains at its edges fragile pockets of human life, surviving only through intra-regional trade. David Abulafia famously applied it to the Sahara and reconceptualised the African desert as a zone of trade and cultural exchange not unlike the Mediterranean.¹⁰⁸ Indeed, Sahara shares striking similarities with other connectedness spaces. A hyper arid waste with pockets of vegetation surrounding isolated springs, the Sahara resembles a honeycomb of micro-regions or districts, their boundaries drawn in the middle of a distance between any two oases. An oasis acts as an economic centre of a single desert district, with its hinterland depending on the oasis for water and foodstuffs. These production and trading hubs are ‘distinguished by their fragility and artificiality’.¹⁰⁹ Fertile desert depressions had to be furnished with water harvesting and storage installations to enable sustainable agriculture but yields still vary from one year to another. In contrast to diversified maritime microeconomies of the Mediterranean, Saharan oases rely on subsistence farming, but they cannot attain self-sustainability in the long run.¹¹⁰ Were they to be entirely isolated, desert farming communities would be extremely vulnerable if crops failed. Consequently, oases depend on intra- and inter-regional foodstuff trade to offset effects of recurrent localised droughts; alternatively, famine-stricken desert communities may resort to raiding their more affluent neighbours to survive.

Indeed, Saharan productivity zones can easily alternate between extreme prosperity and poverty due to seasonal changes in aquifer output. Under favourable conditions, a Saharan water-dependent subsistence microeconomy may enter a period of self-amplifying development through a positive feedback loop, as happened in the case of the desert-dwelling Garamantes (ca. 500 BCE–700 CE) of southwestern Libya (Fazzan). The Garamantes progressively tapped into local fossil aquifers with elaborate water harvesting systems, increasing agricultural yields and sparking

generalised population growth in the area. As the population swelled beyond the land's capacity, the Garamantian communities were first incited to trade with – and then raid – their neighbours. Enslaved tribes were directed to conserve and extend the Garamantian water harvesting systems, boring even deeper into the water table to increase their output. The positive feedback loop repeated until overexploitation of harvesting systems exhausted non-renewable fossil aquifers and brought about the collapse of an entire economy.¹¹¹ The Garamantian state subsequently fragmented and devolved into basic fragile self-subsistence microeconomies. Of importance to this study is the strong causal relationship between the improvement of water availability in a desert micro-region and the resultant improvement of intra- and trans-regional connectedness. All desert road networks function thanks to water nodes: an increase in their number brings about an increase in the desert road network density.

2.2.2. Roman bias in dating desert roadside sites/nodes in Egypt

Scholars of desert roads in Egypt have often entertained the notion that the advent of Romans to Egypt spurred extensive development in the desert communities. Notwithstanding the attested agricultural and hydraulic development of oasis communities in that period, the entrenched belief that Romans were ingenious engineers, facilitators of trade, and builders in the Egyptian desert has led many 19th and early 20th century explorers to accept as true that almost all intriguing ruins (cisterns, forts, enclosures) found in the vicinity of Egyptian desert trails must be Roman in origin. Those who displayed this Roman bias were usually not deterred by the fact that the ruins in question had not been properly surveyed or excavated. For instance, M. Maspero once surveyed the length of Masrab Diqnash, a desert trail linking Siwa to the Mediterranean port of Sallum. Resting at the way-stations close to the sea, he noted a number of old rectangular underground cisterns for storing rainwater and offhandedly decided they 'were built by the Romans in the second century A.D., and were in use until the middle or end of the fourth century';¹¹² Maspero's unconfirmed claims were repeated verbatim by later scholars, having only recently been proven to be true.¹¹³ Traces of a similar attitude linger in contemporary scholarly works. Robert Jackson classified (according to unknown criteria) the Marmarican roadside complex at Bir al-Kanayis as Roman. His identification was later proven to be correct, but it is worth noting that Bir al-Kanayis had not yet been properly surveyed or excavated during Jackson's visit.¹¹⁴

Unfortunately, in cases of unsubstantiated Roman identifications, it is often difficult to ascertain whether the period identification was an educated guess on an author's part or rather a subconscious expression of internalised colonial paradigm according to which local desert population could not build any impressive structures without the support of Roman know-how. Problematically, many modern authors heedlessly quote older authorities on these structures, perpetuating their unfounded identifications. Pieces of current research demonstrated that many sites previously thought to be Roman were wrongly dated and had to be retroactively re-assigned to

Late, Persian, or Ptolemaic periods. For instance, surveys at the Eastern Desert site of Barramiya found remains of a large basin surrounded by a rectangular wall. Steven Sidebotham hypothesised this structure was once an Early Roman water cistern/*praesidium*; nonetheless, Klemm and Klemm convincingly demonstrated that the structure served as a Ptolemaic gold washing basin and that there were no signs of any Roman activities at the site.¹¹⁵ The Roman bias poses particular problems in the Western Desert, where the trails are not flanked by easily datable ruins of Roman *praesidia*. Consequently, Roman dates for the otherwise contextually-isolated sites in the Western Desert should be treated with caution.

2.2.3. Desert road density in Roman Egypt – continuity and change

One of the rationales for desert travel was a desire to mine and transport precious and semi-precious stones, but Western Desert has very little of these. One possible option was military control, conquest or opening of trade routes. All these rationales are subject to change when socio-political factors change: this is why desert tracks may shift, move or fall into disuse.¹¹⁶

At this point of the chapter, one should briefly reconsider circumstances that generate and direct desert traffic in specific areas of Egypt and specific periods of its history. As for spatial aspects of desert traffic, it goes without saying that certain regions of Egypt have more nodes and therefore generate/attract more traffic, whereas other regions lack nodes and generate/attract little traffic. The number of attractant nodes in a given area is determined by a combination of natural and anthropogenic factors. Notwithstanding slow climate changes, the natural environment of the desert does not change if left undisturbed, while anthropogenic influences can affect fundamental and far-reaching changes in the desert environment. One might, at this point, return to the example of the Garamantian expansion in southwestern Libya. Fragile desert communities can occasionally alter their environment to such a degree that an initially barren landscape can for a time support a much larger population than would be expected. Transforming the Sahara – either through establishment of new, artificial activity nodes (resource exploitation, trade, military control) or through augmentation of previous subsistence nodes (water/agriculture), results in marking new desert trails or reopening of the old ones, with activity nodes acting as attractant points funnelling desert traffic into discernible corridors. Significantly, not all desert areas are equally suited for anthropogenic development, but almost all have been optimised in one way or another, with road installations built for added comfort and safety of travellers.

Conversely, if one is to investigate diachronic changes in the desert road network density in selected regions of Egypt, one must remember that such networks analysed in terms of continuity and change oftentimes strike a precarious balance between maintaining status quo and accommodating for changes in the quality and number of activity nodes. Desert trails travelled by Egyptians have been tried and tested by innumerable generations of scouts and explorers, often being ‘compromises between

the shortest distance and the difficulties to overcome specific obstacles',¹¹⁷ To alter the run of such a well-travelled trail would require external stimuli of considerable power, such as emergence of new, significant attractant nodes that would partially siphon off desert traffic towards them. Such nodes are often connected to water harvesting and redistribution systems. As stated before, an improvement of water availability in a desert micro-region commonly results in an improvement of intra- and trans-regional connectedness. Securely dated nodes can be included in diachronic network analyses; nonetheless, the archaeological context at such sites often spans several epochs and often lacks an easily discernible Roman layer, in which case one needs to tread carefully to reduce the Romanocentric bias that creeps into some works of scholars dating the desert sites of Egypt.

As for this book, I have chosen to investigate two chosen areas that saw an increase in the desert road density during the Roman period. I intend to examine selected regions for natural and anthropogenic factors that could have influenced the local desert traffic, with the following research questions in mind:

- a) What was the influence of terrain topography and geology on the road/node density in analysed desert areas?
- b) What was the road/node density in analysed desert areas before the advent of Romans (continuity)?
- c) How much did the road/node density increase in analysed desert areas under the Romans (change) and why?

Subsequently, in chapter three I appraise the role of pack animals in the desert transport under the Romans, showcasing why the adoption of camel as the beast of burden changed the nature of desert travel in Egypt. The following three chapters (four, five, and six) of my book discuss desert roads of the Sinai Peninsula and the Eastern and Western Deserts. When possible, I focus on traffic corridors and nodes that contain discernible quantities of the Roman material, but I do not pass over roads that may be expected to have seen traffic in the Roman period but yielded no Roman material. The seventh chapter of the book compiles the amassed body of evidence and employs it to discuss continuity and change in the desert road networks under the Romans, the investigated areas comprising (a) Marmarica and (b) the central and southern section of the Eastern Desert.

Notes

- 1 Riemer and Förster 2013, 26. For a useful discussion of the 'primacy of destination' concept, see Cummings and Johnston (2007, 1–6). Today, archaeologists almost uniformly reject the notion of 'invisible nomads' (cf. Bradley 1992).
- 2 Guy Wagner's work, *Les oasis d'Égypte...*, can be taken as an example of a conservative treatise on Egypt's ancient desert roads, with the author's focus almost entirely on the papyrological evidence (1987, 140–154).
- 3 Riemer and Förster 2013, 26.

- 4 Gates 2006, 316; Riemer and Förster 2013, 32. Among the studies employing novel, linear-focused approaches to the archaeology of mobility one might mention such edited volumes as Beaudry and Parno's *Archaeologies of Mobility and Movement* (2013), Barnard and Wendrich's *Archaeology of Mobility* (2008) and *Landscapes of Movement* by Snead, Erickson and Darling (2009).
- 5 For desert road studies exploiting satellite imaging for studying the Sahara, see Bubenzer and Bolten (2013, 61–76), Lohwasser (2013, 425–435) and Bard, Fattovich and Manzo (2013, 549–552).
- 6 Such studies were often conducted on an area-by-area basis: Steven E. Sidebotham's teams surveyed the central and southern sections of the Eastern Desert (e.g. Sidebotham, Zitterkopf and Helms 1991; 2000; Sidebotham and Zitterkopf 1995; 1996; 1997; 1998; Sidebotham 1996; 1997; 2011); the Theban hinterland was surveyed by the Theban Desert Road Survey teams from Yale University (e.g. Darnell and Darnell 2002a; 2013a); the lands southwest of Aswan were scouted by Yale Toshka Desert Survey teams (Darnell 2002b, 166–168, 173–174; 2003, 73–91; 2004, 25–32; Darnell and Darnell 2013b, 35–52), and finally the coast of Marmarica and its hinterland were examined by Eastern Marmarica Survey teams (Vetter, Rieger and Nicolay 2009; 2013; 2014; Rieger *et al.* 2012).
- 7 Förster *et al.* 2010; Riemer and Förster 2013, 25–26, 32.
- 8 Cribb 1991, 68; Riemer and Förster 2013, 38.
- 9 Förster *et al.* 2010, 50.
- 10 Förster *et al.* 2010, 63.
- 11 Sidebotham, Hense and Nouwens 2008, 23–24; Sidebotham 2011, 8–9.
- 12 Bagnall, Bülow-Jacobsen and Cuvigny 2001, 325–333; Amer *et al.* 2012, 13–16; Sidebotham 2011, 92–99; Bard, Fattovich and Manzo 2013, 551.
- 13 Bard, Fattovich and Manzo 2013, 549–552.
- 14 Greenwood 1997, 29.
- 15 Verreth 2006, 151.
- 16 Greenwood 1997, 29; Hoffmeier and Moshier 2013, 491.
- 17 Greenwood 1997, 31–32.
- 18 Greenwood 1997, 29.
- 19 Greenwood 1997, 31–32.
- 20 Greenwood 1997, 30–31.
- 21 Mumford 2015, 1–6.
- 22 Greenwood 1997, 39–40.
- 23 Greenwood 1997, 45; Beit-Arie 2003, 1–2.
- 24 Fakhry 1973, 11.
- 25 Eichhorn *et al.* 2005, 214.
- 26 Bubenzer and Bolten 2013, 64.
- 27 El-Baz *et al.* 1980, 51–59; Czerniewicz, Lenssen-Erz and Linstädter 2004, 81–96.
- 28 Clayton, Trafford and Borda 2008, 129–134.
- 29 Murray 1968, 153; Darnell and Darnell 2006.
- 30 Darnell and Darnell 2013b, 35–52.
- 31 Butzer and Hansen 1968, 334–350; Burmil 2003, 427–440.
- 32 Wright 2007, 15.
- 33 Eichhorn *et al.* 2005, 214; Vetter, Rieger and Möller 2013, 456–458;
- 34 Butzer and Hansen 1968, 423; Zitterkopf and Sidebotham 1989, 163–164; Sidebotham 2011, 8; Hoffmeier and Moshier 2013, 491, 494.
- 35 Zitterkopf and Sidebotham 1989, 164; Sidebotham, Hense and Nowens 2008, 25; Sidebotham 2001, 8–9; Amer *et al.* 2012, 13–14.
- 36 Zitterkopf and Sidebotham 1989, 164; Sidebotham, Hense and Nouwens 2008, 26.
- 37 Butzer and Hansen 1968, 334–350; Zitterkopf and Sidebotham 1989, 163.

- 38 Butzer and Hansen 1968, 334–350.
- 39 The prime examples of such settlements are Roman towns of Gerra, Pentaschoenum, Casium, and Ostracine, situated near the modern Lake Bardawil; the colonies had little to no natural water sources (with brackish groundwater due to the neighbouring sea) and in the 1st century CE apparently still had to bring their water from elsewhere (Josephus, *The Jewish War* 4.66; Strabo, *Geography* 16.2.32; Figueras 2000, 207). See section 4.2.2 for further discussion.
- 40 One such desert site was an as-yet-unidentified outpost on the road between Bahariya Oasis and the Nile Valley city of Oxyrynchus: private letters on Oxyrynchite ostraca record road overseers asking their colleagues for water and provisions. Kaplony-Heckel 1994, 229–238; *O. dem. Köln* 38, 78, 163, 219, 286; Thissen 2013, 391–397.
- 41 Butzer and Hansen 1968, 334–350.
- 42 Oases of the al-A'reg group (al-A'reg, Bahrein, Nuwemisa, and Sitra) have access to relatively abundant water sources and could have once hosted (semi-)permanent communities. Unfortunately, they remain unsurveyed.
- 43 Butzer and Hansen 1968, 334–350; Amer *et al.* 2012, 13–14, 24.
- 44 Zitterkopf and Sidebotham 1989, 163.
- 45 Indeed, minor Egyptian waterholes such as Shayata, Abu Gerara, Kurkur, or Dunqul hosted small groups of inhabitants, but these were often transients.
- 46 Harding-King 1925, 304, 1913, 459–460; Fakhry 1974, 162; Giddy 1987, 13–14, 25 n. 101–102; Wagner 1987, 150; Graeff 2005, 65. See also section 6.9.3.
- 47 Fakhry 1974, 26; Giddy 1987, 14, 25 n. 103–106, Wagner 1987, 150; Jackson 2002, 231; Graeff 2005, 63; Finocchi and Medaglia 2011, 94, 102–103, 105.
- 48 Modern advances in well-boring made it possible to draw water from almost any point in the desert: however, the cost of such an operation would often be prohibitively expensive.
- 49 Scheele 2010, 284–287; Wilson 2012, 222.
- 50 Burmil 2003, 431–432; Schörle 2012, 59–60; Wilson 2012, 222.
- 51 Burmil 2003, 427–440; Wilson 2012, 222.
- 52 Riemer 2013, 47.
- 53 Pliny the Elder, *The Natural History* 31.46.
- 54 Morkot 1996, 92; Shortland, Tite and Ewart 2006, 153–158.
- 55 Pliny the Elder, *The Natural History* 31.39.79; Kuhlmann 2013, 147–148.
- 56 Oliver and de Cosson 1938, 171–172; Klemm and Klemm 2001, 641; Graeff 2005, 18–19, 26.
- 57 Klemm and Klemm 2001, 638–639.
- 58 Pliny the Elder, *The Natural History* 36.11.55; Adams 2007, 196–197; Sidebotham 2011, 167.
- 59 For a list of such sites, see Sidebotham 2011, 167.
- 60 Klemm and Klemm 2013, 615–616.
- 61 Peacock and Maxfield 2007 (*passim*); Klemm and Klemm 2008, 269–280; Sidebotham 2011, 167.
- 62 Sidebotham 1996, 186–189; Klemm and Klemm 2008, 291; Sidebotham 2011, 167.
- 63 Van der Veen and Hamilton-Dyer 1998, 101; Klemm and Klemm 2008, 280–290; Sidebotham 2011, 167.
- 64 Sidebotham, Zitterkopf and Riley 1991, 580–582; Sidebotham 2011, 167.
- 65 Klemm and Klemm 2008, 290–291; Sidebotham 2011, 167.
- 66 Sidebotham 1996, 189–190; 2011, 167; Klemm and Klemm 2008, 294.
- 67 Tregenza 1950, 85–89; Meredith 1952, 106–107; Cuvigny 1996b, 92; Barnard 2007f; Sidebotham, Hense and Nouwens 2008, 82–84; Klemm and Klemm 2008, 291–294; Sidebotham 2011, 167.
- 68 Harrell and Brown 1992, 8; Harrell 2002, 238–240; Klemm and Klemm 2008, 297–311; Sidebotham 2011, 167.
- 69 Sidebotham 2001, 167; Harrell 2002, 240; Klemm and Klemm 2008, 312–314.

- 70 Klemm and Klemm 2013, 29; Marouard 2014, personal communication; Tallet and Marouard 2014, 4, 13; .
- 71 Shaw 2002, 249–250; Sidebotham 2011, 172.
- 72 Shaw and Jameson 1993, 81–97; Shaw 2007, 319–328, 2002, 249–250; Sidebotham 2011, 172.
- 73 Meredith 1957, 117–119; Bernand 1977, 136–140; Shaw 2002, 249; Harrell *et al.* 2006, 127–162; Sidebotham 2011, 172.
- 74 Klemm and Klemm 2002, 215–231; 2013, 12, 15–16, 613–616; Sidebotham 2011, 172.
- 75 Green 1909; De la Roque 1922, 136–37; Murray 1925, 146; Meredith 1952, 106, 110–111; Graeff 2005, 151; Barnard 2007c.
- 76 Meredith 1952, 107, 110; Klemm 1994, 219; Sidebotham 1996, 190; Barnard 2007d; Sidebotham, Hense and Nouwens 2008, 221.
- 77 Meredith 1952, 110; Barnard 2007e; Sidebotham, Hense and Nouwens 2008, 221.
- 78 Murray 1925, 146; Graeff 2005, 151; Harrell *et al.* 2006, 129–130.
- 79 Meredith 1952, 111; Tregenza 1958, 146, 176–77.
- 80 Klemm and Klemm 2013, 12–16. See section 5. 2. 3.
- 81 Harrell and Brown 1992, 8.
- 82 Sidebotham 1997, 387; Bagnall *et al.* 2006, 219–220; Sidebotham, Hense and Nouwens 2008, 235–236; Barnard 2011; Sidebotham 2011, 135; Klemm and Klemm 2013, 238–249.
- 83 Meredith 1953, 95, 97; Klemm and Klemm 1994, 220; Sidebotham and Zitterkopf 1998, 390; Sidebotham 2011, 102, 133; Klemm and Klemm 2013, 193–198.
- 84 Klemm and Klemm 2013, 616.
- 85 Such easily accessible resources comprise evaporite and sedimentary deposits of the Western Desert, which often were within walking distance from an oasis or another water source.
- 86 Van der Veen and Hamilton-Dyer 1998, 101. However, some quarrying sites show traces of garden cultivation, with vegetables and herbs supplementing provisions imported from the Nile Valley (Cappers 1998, 76; Van der Veen 1998, 221–242).
- 87 Scheele 2010, 281–284, 297–301; Schörle 2012, 59–63; Wilson 2012, 414–419.
- 88 Importantly, Sahara was as much a production zone as it was a transit/consumption area (Wilson 2012, 413).
- 89 Horden and Purcell 2000, 272; Scheele 2010, 288.
- 90 Adams 2007, 5–6; Roe 2005/2006, 128–129; *contra* Finley (1973, 126) and other proponents of *primitivist economy*, who believe that transport of cheap, bulky goods would be unfeasible in the ancient context.
- 91 Bagnall 1993, 146; Worp 1995, 147–151; Roe 2005/2006, 128; Adams 2007, 8–9.
- 92 Adams 2007, 159–161.
- 93 Sidebotham 2011, 78–80.
- 94 Roe 2005/2006, 128–129. Obviously, large stone blocks could not be easily stolen.
- 95 Wright 2007, 12.
- 96 Breeze 2011, 118.
- 97 Sidebotham, Zitterkopf and Riley 1991; Maxfield 1996, 11–15; 2005, 732; Sidebotham, Hense and Nouwens 2008, 51–52.
- 98 Morkot 1996, 82–84; Eichhorn 2005, 226.
- 99 *P.Oxy.* 12.1439 (70 CE); Wagner 1987, 147–148; Drecoll 1997, 173; Hennig 2004, 267–284; Adams 2007, 30; Kaper 2009, 169–178; Förster *et al.* 2010, 152–153; Rossi 2013, 331, 333–335.
- 100 Maxfield 1996, 17–18.
- 101 Maxfield 1996, 15–16.
- 102 Sidebotham 2011, 166.
- 103 Figueras 2000, 11, 207.
- 104 Josephus, *The Jewish War* 4.66; Strabo, *Geography* 16.2.32; Figueras 2000, 207.
- 105 Dunn 1977, 130.

- 106 The mid- and late-20th century studies on trans-Saharan connectivity often critically examined the earliest purported crossings of the desert: Classical scholars investigated whether Carthaginians, Greeks or Romans ever reached sub-Saharan Africa (*e.g.* Carpenter 1956, 231–242; Desanges 1964, 713–725; Law 1967, 181–200; Liverani 2000, 496–520; Kirwan 2002, 71–74) and Africanists wondered whether iron-working technology was imported to Africa via the Sahara or not (*e.g.* Oliver and Fagan 1975; Calvocoressi and David 1979, 1–29; Sutton 1983, 81–88; Kense and Okoro 1993, 449–458; Alpern 2005, 41–94; Fenn *et al.* 2009, 119–146). In turn, Early Modern and Modern historians examined the post-Medieval trans-Saharan trade in its fully developed form (*e.g.* Wright 2007; Lydon 2009; Austen 2010). At the end of 20th century CE, scholars progressively began to realise that trans-Saharan connections were rarely, if ever, direct – in fact, the Sahara by and large functioned as a zone of internal trade, with many goods produced and consumed within the desert (Scheele 2010, 281; Wilson 2012, 222; Gliozzo *et al.* 2014, 218–241).
- 107 Scheele 2010, 282–284; Schörle 2012, 59–60.
- 108 Abulafia 2005, 74–75; Schörle 2012, 60.
- 109 Schörle 2012, 59–60; Wilson 2012, 222.
- 110 Scheele 2010, 282–284; Schörle 2012, 59.
- 111 Pelling 2005, 397–412; Schörle 2012, 63–64; Wilson 2012, 420–423, 427; Mattingly and Sterry 2013, 503–518.
- 112 Belgrave 1923, 43–44.
- 113 Belgrave 1923, 43–44; Giddy 1987, 17; Rieger *et al.* 2012, 170 fig. 25; see section 6. 3. 3.
- 114 Jackson 2002, 255; Rieger *et al.* 2012.
- 115 Meredith 1953, 95, 97; Klemm and Klemm 1994, 220; 2013, 193–198; Sidebotham and Zitterkopf 1998, 390; Sidebotham 2011, 102, 133; see also section 5. 2. 7.
- 116 Förster 2010, 52–53.
- 117 Förster 2010, 63.

Pack animals in ancient Egyptian desert transport: shifting patterns of use

The following chapter analyses the role of donkeys, camels, oxen, and horses in the desert transport of ancient Egypt. Donkeys were well-known in ancient Egypt from its beginning; in contrast, camels flicker in and out of archaeological record, appearing infrequently at archaeological sites, in literary sources, and works of art. The introduction of first donkey and then camel fundamentally changed the nature of desert travel. Domestication of donkeys in Egypt enabled Egyptians to enter the desert and stay there for a number of days, provided that water and fodder supplies were adequate. Camels could go without water for days, covering significantly longer distances; previously inaccessible places opened up when camels began to wander the Sahara.¹ In contrast, oxen and horses were rarely used as desert transport in Egypt due to their large water and fodder requirements and low heat tolerance. To demonstrate how the introduction of camels changed desert travel in ancient Egypt, I present, compare, and discuss pertinent aspects of physiology of donkeys, camels, oxen, and horses, their water and fodder needs, maximum load capacities, and daily marching distances; all these data are supplemented by short historical surveys of their use as pack animals of ancient Egypt.

3.1. Donkeys

3.1.1. General information

Durable and resilient, donkeys were the first pack animals used for desert travel in ancient Egypt. Donkey (*Equus asinus*) comes from the African wild ass (*Equus africanus*), most probably the Nubian wild ass (*Equus africanus africanus*).² Research in genetic sequencing implies donkeys have been independently domesticated many times in many different regions, with slightly different breeds arising as a result.³ Whatever was the rationale behind the animal's domestication remains disputable. One possible reason might have been the rapidly worsening desertification of the

Saharan hinterlands, which began ca. 5000 BCE, after the preceding, relatively humid phase of Neolithic Subpluvial (ca. 7500/7000–5000 BCE).⁴

In the arid and semi-arid regions of Northern Africa, donkeys remain the cheapest and best-adapted pack animal obtainable. They are highly obedient and can be trained for work or travel in a relatively short period between one week and one month.⁵ Donkeys have good spatial memories, remember roads, and can find their way home without a guide.⁶ They are easy to breed, long-lived (30–40 years if well cared-for,⁷ out of which 12–15 years of working life⁸), and relatively cheap in comparison to other pack animals. By their fourth year, they may start carrying loads.⁹ A properly trained and socialised donkey will quite happily carry loads for most of its life; nonetheless, at times, these equids might develop maladaptive habits. Their gregarious nature causes them to suffer when they are separated from their herds or kept alone for longer periods; furthermore, these curious and easily distracted animals will get rambunctious and noisy when not properly exercised, and they might wander off if not kept in enclosures or roped.¹⁰ Thus, proper initial training and handling is vital.

3.1.2. *Date of introduction to Egypt and history of use*

What little early evidence there is suggests donkeys were domesticated in Egypt ca. 4000 BCE or even earlier.¹¹ At the initial stage, few tell-tale markers of domestication appear in the studied material; notably, the osteological remains do not differ between wild and domesticated specimens.¹² Lack of differences in bone structure impedes efforts at dating the first domestication attempts; notably, wild African ass (*Equus africanus*) remains turn up at remote Late Palaeolithic and Early Neolithic sites in Egypt, yet they are thought to originate from wild specimens that died at waterholes frequented by the local nomadic population and thus contaminated the archaeological context.¹³ These isolated sites point to an important aspect in donkey domestication. Probably, it was the desert nomads – and not the Nile Valley cultures – that first noticed and hunted wild donkeys,¹⁴ subsequently starting to use them as pack animals.¹⁵ Growing environmental pressures from the Sahara's desiccation forced these desert dwellers to harness donkeys to facilitate crossings between water sources and posts in long-distance trade in valuable goods;¹⁶ only in the Predynastic Period, the Nile Valley inhabitants began to mimic desert tribes and use asses as beasts of burden.¹⁷

Earliest confirmed traces of donkey domestication in Northeastern Africa come from Predynastic settlements in El-Omari (ca. 4600–4400 BCE),¹⁸ Maadi (ca. 4000–3500 BCE),¹⁹ and Hieraconpolis (ca. 3600 BCE).²⁰ Ten donkey remains recently found in 1st Dynasty Abydos tombs ca. 3000 BCE show skeletal pathologies indicative of prolonged use for heavy load transport,²¹ although the large size of remains implies at least some of the animals were caught in the wild and not bred in captivity.²² Thus, it appears that the first donkeys used in desert transport were caught on-site as needed and only then trained to bear loads; the provisional nature of such arrangements may explain

why genetic sequencing points to donkeys having been independently domesticated in many different regions and periods.²³

In the Dynastic Period, domesticated donkeys were used from the 1st dynasty onwards.²⁴ By the 6th Dynasty, they were used as desert pack animals. Harkhuf, an Egyptian governor and desert trader, used three hundred to bring to Egypt precious goods he got in the land of Yam,²⁵ and a nobleman Sabni set out with a hundred donkeys to recover his deceased father's body from Nubians.²⁶ In the Middle Kingdom, caravans consisting of up to one thousand donkeys were not unheard of, as evidenced on the stela from Toshka-West.²⁷ Despite their ubiquity, well-trained and healthy donkeys were usually in high demand as beasts of burden and transport. We know of some affluent farmers of New Kingdom Deir el-Medina, who loaned donkeys to their neighbours for extortionate rates; at times, a 100-day loan could cost as much as a new animal, yet their clients did not seem to mind steep prices.²⁸ Donkey remained the pack animal of choice throughout the Persian and Ptolemaic periods, with a plethora of them mentioned in public and private documents; the Roman period was no exception.²⁹

3.1.3. Water and fodder needs

Donkeys have the second-lowest water requirement of all pack animals, bested only by camels.³⁰ As always, actual amounts drunk by a single animal vary from 10 to 18 to even 35 litres per day, depending on temperature, walking distance, and load.³¹ Donkeys can go up to three days without water,³² tolerating dehydration up to 30 per cent of their body weight, a feature they share with camels and sheep.³³ Moreover, they can rehydrate quickly once given access to water.³⁴

While watering donkeys regularly is important for their general health, one should also provide them with standing water to dip their hooves in. In normal conditions, donkeys wade into water when drinking, moistening their hooves.³⁵ If not properly moistened, donkey hooves are particularly prone to water loss, inflexibility, and cracking. These afflictions are often followed by infections and increased susceptibility to sharp objects that may penetrate the hoof.³⁶ Injured hooves and foot sores might be alleviated by consistent wearing of protective footwear, which somewhat eases the pain.³⁷

Donkeys have modest dietary requirements, being able to digest high fibre forage diets easily; a steady fare of hay and grasses provides large quantities of plant cellulose, digested by gut bacteria into organic acids for food energy.³⁸ Left on their own, animals contentedly graze and browse on whatever grasses and shrubs they can find in the vicinity,³⁹ usually satisfying most of their requirements after ca. six hours of feeding.⁴⁰ As a result, donkey caravans rarely carry fodder for the animals. Most of the time, even the desert provides donkeys with enough scrub to graze on.⁴¹ One essential nutrient donkeys might not get in adequate quantities from grazing in the wild is protein, which they can most readily obtain from ingesting legumes. Usually, one part of legumes should be ingested for every four parts of highly fibrous

foodstuffs, such as hay or leaves.⁴² Strenuously working animals, younger donkeys, and lactating females need proportionally more protein in their diets and benefit from legume supplementation.⁴³ In general, animals should eat from 3 to 5 per cent of their bodyweight in dry fodder.⁴⁴ This amount approximately equals from 4.5 to 7.5 kilograms of fodder for an animal weighing 150 kilograms, although donkeys will usually ingest only about half of that.⁴⁵

3.1.4. Acceptable loads and marching distances

How much a donkey can carry depends on numerous factors such as the distance to be covered, the ambient temperature, individual fitness of the animal in question, the degree of hydration, and whether donkeys can rest and for how long.⁴⁶ Record carriers endured loads of more than 100 kilograms for more than a day or even up to 200–300 kilograms for very short trips.⁴⁷ In percentages, the maximum acceptable load of a donkey ranges from 25 to 40 per cent of its live weight, with an average capacity up to 33 per cent.⁴⁸ In kilograms, this range of numbers translates into acceptable maximum loads of 50–100 kilograms for animals weighing respectively from 150 to 300 kilograms;⁴⁹ higher loads can be carried for a short time,⁵⁰ but they are not recommended.⁵¹ The scholarly consensus is that a single donkey in Graeco-Roman Egypt typically carried 3 artabas (ca. 130 litres or 80 kilograms) of grain and pulled 5 to 6 artabas (ca. 215–260 litres or 135–162 kilograms) of grain on a wagon; however, these are only mean values and exact weight of dry weight loads was adjusted with an animals' individual fitness in mind.⁵² Similarly, liquid loads born by donkeys somewhat varied in weight.⁵³ Data from Fayum villages confirm weights were adjusted according to conditions. Adams noted that donkeys were given heavier loads when they had to cross a shorter distance.⁵⁴

Extraordinary climbers, donkeys move fast in the mountains, preferring the hard, rocky ground over softer surfaces.⁵⁵ This extremely efficient adaptation to rugged terrain can at times become a disability. Donkeys need to walk at least 15 kilometres daily on hard surfaces to file off their growing hooves; if they are kept on soft ground or they are not walked every day, they might eventually suffer from hoof ailments and lameness, afflictions similar to those caused by excessively dry, improperly moistened hooves.⁵⁶ Overabundance of moisture has similar effects; donkeys continually kept in damp conditions risk developing hoof thrush, a disease that – if left untreated – will usually cripple the donkey for life.⁵⁷

The pace of loaded donkeys in the desert varies little, on average being somewhere between 4.5 and 5.7 km/h, and it cannot be vastly increased in usual conditions.⁵⁸ The total distance to be covered per day affects the maintainable pace; pack donkeys faced with shorter distances can cover them slightly faster than usual, even if burdened with heavier loads. For instance, a donkey loaded with a relatively light load of 25–70 kg, travelling 6 hours a day walks at steady 4 km/h, covering 24 kilometres per day.⁵⁹ Conversely, a donkey burdened with a slightly heavier load between 50–80 kilograms can be forced to walk at the pace of nearly

5 km/h, but it will tire after 4 hours, thus covering only 20 kilometres per day.⁶⁰ Unburdened donkeys can walk several hours; modern donkey caravans travelling in winter report they typically walk 11 or 12 hours, covering distances up to 45 kilometres per day.⁶¹

3.1.5. *Significance: very popular*

Cheap, resilient, and undemanding, the donkey has remained popular in ancient Egypt from its domestication in the Predynastic Period to 21st century CE. Prior to the camel's arrival, donkeys were the pack animals of choice for mid- and long-range desert travellers; even in Roman Egypt, donkeys were still prized for their low price and resilience. Significantly, donkeys carried loads on the Abu Ballas Trail, arguably the first long-range desert trail in ancient Egypt, probably used ca. 2200 BCE.⁶² This important trail, early Egypt's gateway to Central Africa, linked the Dakhla Oasis to Gilf Kebir Plateau and regions further south. Infrastructure of the trail was specifically designed with donkeys as pack animals in mind. Pottery caches for water and food were placed in regular intervals throughout the length of the trail, intervals that closely correspond to distances a donkey can cover in the desert terrain without drinking.⁶³ The total water capacity of amassed pottery along the trail amounts to 13000 litres, with approximately 6 tons of pottery strewn along – an amount that showcases the scope of this water-procuring venture.⁶⁴ Remains at the pottery caches indicate the trail was intermittently used up to the Islamic period.⁶⁵ Throughout these times, donkeys were the resilient pack animals that bore the loads in that inhospitable region, with their representations occasionally carved onto water pots and rocks on the trail.⁶⁶

3.2. Camels

3.2.1. *General information*

Out of many prehistoric species in the camel family, only two were preserved in the Old World: a one-humped dromedary (*Camelus dromedarius* L.) and a two-humped Bactrian (*Camelus bactrianus*).⁶⁷ Dromedaries live in Northern Africa and western Asia, reaching into Northern India along the shores of the Indian Ocean; Bactrians are more common in central Asia, although the species share their range near the Caspian Sea.⁶⁸ Visible similarities between Bactrians and dromedaries have led some scholars to argue for these being two races of the same species.⁶⁹ Opponents of this hypothesis stress that crossbreeding animals of the same species, yet different races, as a rule, produces viable, fertile offspring. For instance, crossbreeding male donkeys (jacks) and female horses (mares) produces hybrid mules;⁷⁰ females occasionally bear children, whereas male mules are always infertile.⁷¹ Corresponding crossbreeding experiments between Bactrians and dromedaries often result in infertile males being born, which points to these two probably being separate species.⁷² They also tend to occupy different ecological niches, with Bactrians preferring mountains and rugged plateaus, whereas dromedaries thrive on flat, arid lands.⁷³

What made camels so important in the desert travel is their versatility and adaptation to desert conditions, succinctly summarised by Gauthier-Pilters and Dagg.⁷⁴ Their adaptation to arid conditions stems from their unique metabolism and behaviour. Camels excrete little water in urine and faeces, and they need to drink only once in several days. Dromedary kidneys filter water so efficiently that the animals can actually subsist on brine. In fact, dromedaries enjoy eating salt, and they need it to thrive.⁷⁵ Once given access to water, healthy animals can rehydrate extremely efficiently. Because dromedaries mainly store fat in their humps, the rest of the body remains relatively uninsulated, and it can remove excess heat by perspiration. Camel fur allows evaporative cooling, but it reflects heat from the environment, resulting in a net heat loss.⁷⁶ Camel behaviour also reflects their adaptation to scarcity of desert environment. Unlike sheep and other grazing animals, camels do not graze continuously in one area, but prefer to wander from plant to plant, taking only one or two bites from each specimen, putting lesser strain on the flora. What is more, camels savour plants inedible or distasteful to other species: hard, dry, salty plants that are rarely overgrazed.⁷⁷ Wandering in search of favourite foodstuffs, camels exhibit an unusual sense of orientation and can almost always return to their former pastures.⁷⁸ Resilient, undemanding, and efficient, camels became the pack animals of choice when introduced to Roman Egypt.

3.2.2. *Date of introduction to Egypt and history of use*

A dearth of literary, archaeological, and pictorial evidence about early use of camels in Predynastic and Protodynastic Egypt continues to astonish researchers, especially if one accounts for the fact that dromedaries were well-known and frequently used in the Arabian lands and Palestine at least since 1700 BCE, if not earlier.⁷⁹ In contrast, the dromedary remains dated before the Assyrian (665 BCE) and Persian (525 BCE) conquests were rarely found at sites in Egypt.⁸⁰ The current consensus is that the species was present in Egypt in small numbers at least since the 3rd millennium BCE, although the traces are so scant that – as mentioned earlier – it is possible that indigenous Egyptian dromedaries had died out several times and were subsequently reintroduced,⁸¹ either from a wild Nubian or, more probably, from an Arabian domesticated stock.⁸²

It is known today that members of the *Camelidae* family lived in the wild in the northwestern corner of Africa, but they probably died out some time before the start of the Dynastic period and had to be reintroduced every so often in the Dynastic period. The earliest indigenous camels living in the discussed area were specimens of *C. thomasi*, a now-extinct species of large camels that once roamed what is today the Saharan wasteland.⁸³ The oldest remains of *C. thomasi* in Egypt were found at the sites in the southwestern part of the country. Bir Sahara and Bir Tarfawi sites east of Gilf Kebir plateau produced the earliest *C. thomasi* fossils, dated to Middle Palaeolithic;⁸⁴ a Sudanese site near Wadi Halfa in the vicinity of the Nile Valley yielded fossils from Upper (Late) Palaeolithic.⁸⁵ In time, *C. thomasi* either evolved into or was

replaced in Egypt by another species of camels, *C. dromedaries*.⁸⁶ Once again, it was the southwestern part of Egypt where the oldest wild dromedary remains in Egypt – tentatively dated to Early Neolithic period – were unearthed at a site south of the Gilf Kebir plateau⁸⁷. Surprisingly, the archaeological records from major sites indicate, after a certain point, dromedary fossils become exceedingly rare in subsequent layers; thus, many hypothesise that these first indigenous dromedaries most probably went extinct sometime before the Predynastic period.⁸⁸

Interestingly, the Nubian Desert in the Proto- and Predynastic periods might have still hosted the remaining wild dromedary populations that had already gone extinct elsewhere in Egypt. Predynastic engravings depicting dromedaries bearing loads and humans dot the rocks at Onib, an extremely remote desert site in Nubia, halfway between the Nile Valley and the Red Sea.⁸⁹ The Onib engravings are of importance for several reasons. First, these are arguably the earliest depictions in the Egyptian deserts of camels used as pack animals. Notably, the oldest remains and depictions of both wild and domesticated dromedaries are found at remote desert sites;⁹⁰ at the Nile Valley sites, such remains and depictions materialise only in the layers dated to later periods. This regularity suggests desert dwellers as a group had more need to use donkeys and dromedaries than the Nile Valley people – and, in consequence, desert tribes pioneered the use of pack animals in the desert trade; only later has the know-how been transferred to the Nile Valley settlements.⁹¹ Analogically to concurrent attempts at donkeys' domestication, camel handlers might have caught dromedaries in the wild when they needed a pack animal and only then trained them to bear loads. When an animal died, another one was caught and trained; notably, desert dwellers did not breed them in captivity. Considering the fact that wild dromedaries were much rarer than wild donkeys, it is unsurprising that attempts at catching and training dromedaries would be infrequent and that indigenous Nubian dromedaries were never fully domesticated and eventually died out, necessitating future imports of domesticates from the Arabian Peninsula.

At the start of the Dynastic period, dromedary remains and depictions briefly materialise in the archaeological context; unfortunately, most pieces of evidence are either found in a disturbed context or cannot be positively identified as depicting or coming from dromedaries. In their seminal 1977 article *Le chameau en Égypte*, Midant-Reynes and Braunstein-Silvestre thoroughly analyse all works of art, animal remains, and other finds considered to be proof of camels' substantial presence in the Dynastic Egypt before the conquests of Esarhaddon in 670 BCE.⁹² The authors aggressively dissect and disprove pieces of evidence available to them. In their view, no artefact can prove camels were domesticated, used, or well-known in the Old and Middle Kingdom Egypt. For Midant-Reynes and Braunstein-Silvestre, the oldest statuette that actually represents a camel (and not some other animal) was a dromedary bearing two water jars, found by Petrie in Rifeh in a New Kingdom tomb from the 19th dynasty (13th century BCE) – and even that figurine is classified by them as an Asiatic import.⁹³ Nevertheless, the depicted dromedary bears distinctive Egyptian water jars of a type

used only during the reign of 18th and 19th Dynasties;⁹⁴ therefore, Midant-Reynes and Braunstein-Silvestre's claim about the dromedary figurine being an import proves groundless. It also was at the break of the 18th and 19th Dynasties when a bowl made from the local Nile clay was adorned with a likeness of a dromedary camel. The bowl was subsequently found in Pi-Ramesses in the northeastern part of Egypt, pointing to the relatively early presence of dromedaries in that region, into which they could have been directly introduced from Arabian lands.⁹⁵ In his 1985 article, entitled *The Camel in Dynastic Egypt*, Michael Ripinsky brings up many early figurines, rock drawings, and faunal remains and consequently argues for a relatively early introduction of camels to Egypt, noting the available body of evidence strongly suggests the dromedary, no matter if domesticated or not, was known to ancient Egyptians.⁹⁶ In contrast to Ripinsky's balanced perspective, Midant-Reynes and Braunstein-Silvestre tend to gloss over certain troubling early finds, uniformly and perhaps narrow-mindedly dismissing any kind of evidence that could disprove their argument;⁹⁷ the author of this work tends to side with Ripinsky in that camels were known in Dynastic Egypt but probably not domesticated.

The scholarly consensus is that domesticated camels descended from the Arabian stock appear in Egypt only in the 7th and 6th centuries BCE, following Assyrian and Persian invaders;⁹⁸ evidently, they were neither employed in greater numbers nor bred in Egypt before the onset of the Ptolemaic Period.⁹⁹ In 670 BCE, the Assyrian armies of Essarhadon marched towards the Delta. It is known that, during their passage, camel caravans led by nomads from Asia supplied soldiers with water.¹⁰⁰ Similarly, Herodotus reports that Cambyses on his approach to Egypt asked the neighbouring Arab tribesmen to grant him safe passage. The nomads filled camel skins with water and transported them on camels to the caches lining the trail from Palestine to the Delta, thus provisioning the army¹⁰¹. During that period, the knowledge about camels and their suitability for desert trade must have spread fairly fast. At Bahariya Oasis, clay camel figurines were found that were dated to the Saite period (ca. 685–525 BC)¹⁰². Whether these were depictions of imported Arabic dromedaries or locally bred animals cannot be currently settled.

After the Greek conquest in 332 BCE, camels (κάμηλοι, *kameloi*) began to be bred and used in Egypt in larger numbers. The stock animals and know-how of camel breeding probably came from the Arabian Peninsula via the Sinai; the camel handlers and breeders were not Arabians but the nomadic inhabitants of the Eastern Desert,¹⁰³ who often traded with their neighbours across the Strait of Bab al-Mandeb and learned from them.¹⁰⁴ In contrast, Egyptians from the Delta most likely never bred dromedaries and bought them from their desert neighbours. The Delta climate does not suit camels, which are susceptible to insect-borne diseases and do not bear excess moisture well.¹⁰⁵

In Ptolemaic Egypt, camels are rarely mentioned in selected papyri and economic texts, but apparently, they were not unheard of.¹⁰⁶ Several sources connect camels with Alexander's conquest of Egypt. When he embarked upon his expedition to Siwa,

camels carried him to the oasis.¹⁰⁷ Many pieces of data concern camels working as beasts of burden and transport in Ptolemaic Egypt. The archive of Zenon, a collection of records, receipts, and documents from the estate of Apollonios, mentions camels used in transport around the estate, in Egypt, and in Palestine,¹⁰⁸ for instance, we know of a caravan of camels that was delayed in the village of Nechthenibis due to the heavy Nile flood that submerged the road.¹⁰⁹ At times, up to eighty animals could be handled at once.¹¹⁰ In the Eastern Desert, camels worked as transport animals in the quarries and bore the loads of Indian cargo from the Red Sea ports to the Nile Valley.¹¹¹ As such, they were considered prestigious enough to be exhibited during the grand procession of Ptolemy II Philadelphus,¹¹² where they carried loads of Eastern spices, re-enacting their routine duties on the Eastern Desert trails under the Ptolemies.¹¹³ Bearers of Eastern luxuries, camels carried connotations of opulence and splendour; even in the Roman era, the camel would retain something of its former Ptolemaic prestige, being the second most expensive desert pack animals after exceptionally demanding horses. According to Roger Bagnall, the reign of Ptolemy II was the time when camels were actually introduced in greater numbers into Egypt. Ptolemy II, a famed importer of foreign species of fauna and flora, could have easily replenished meagre Egyptian stock of camels with fresh Palestinian imports.¹¹⁴ Thus, camels could be both a novelty and an established symbol in Ptolemy's procession. Known, but never numerous, they would acquire the air of luxury, animals from Arabia carrying Indian wares.

In the Roman period, camel use is attested by literary sources,¹¹⁵ ostraca,¹¹⁶ papyri,¹¹⁷ and terracottas depicting loaded camels.¹¹⁸ Camels were used as pack animals in Eastern desert transport in the 1st century CE. The group of ostraca jointly known as the Archive of Nikanor records bustling business operations of a family company that transported goods between the Nile Valley city of Coptos and the Red Sea ports of Myos Hormos and Berenike between 18 BCE and 69 CE.¹¹⁹ Camels were an essential part of the venture, with one ostrakon explicitly calling Nikanor a cameleer, *καμη(λοτρόφος)* (*kame[lotrophos]*).¹²⁰ Camel-keeping and camel transport were also traditional sources of income for many nomads, who roamed the Eastern Desert during the Roman period. Several Nabataean inscriptions were left by individuals who identified themselves as cameleers,¹²¹ one of them adding the current date of 266 CE.¹²² Dromedaries were occasionally employed in the Roman army. The late 4th century military document, *Notitia Dignitatum*, mentions three camel-mounted troops stationed in Upper Egypt, one of them, *Ala III dromedariorum*, stationed at Kaine (modern Qena), close to Coptos, the desert road junction where the trails towards the Red Sea began.¹²³

Another important source that provides us with a wealth of details about dromedaries and their use in Roman Egypt are camel sale contracts. Camel owners recorded coat colours and teeth health,¹²⁴ often adding details about brands with which they marked their animals,¹²⁵ brands placed on thighs, necks, cheeks, or chests.¹²⁶ According to contracts preserved in the papyri, in the 2nd century CE, camels were almost prohibitively expensive: 'a camel could cost up to four times as much as a

donkey,¹²⁷ with male camels costing between 352 and 680 drachmas¹²⁸ – and females between 450 and 820 drachmas'.¹²⁹ Interestingly, the 2nd and 3rd centuries are the time when artistic depictions of camels became more and more realistic. Even though artists might have familiarised themselves with these animals by that point, consistently high prices strongly indicate dromedaries were highly specialised pack animals in high demand in Roman Egypt. Curiously, the camel prices continued to rise in the latter part of the analysed period. A sales receipt dated to 289 CE records the sale of an Arabian camel for which its new owner had to pay an exorbitant price of 16 talents and 3000 drachmas.¹³⁰ In the 4th century CE, the prices occasionally soared up to 9 talents, although the pricing was probably caused by rampant inflation;¹³¹ nonetheless, the real value of a camel probably did not go down much, if it did go down at all.

To gauge the relative spread of camel population in the communities of Egypt, we may attempt to analyse artistic depictions of camels dating to that period and observe if there are any chronological developments. Preserved camel terracottas portray animals in diverse poses. Dromedaries are either shown alone or with their handlers, lying down or standing erect. They often bear loads, carrying palanquins, amphorae, baskets, or barrels. Some of them are ridden, bearing saddlecloths or simple saddles; others show no signs of any harnesses.¹³² In the Early Roman period (30 BCE–early 3rd century CE), camel figurines were apparently fairly unsophisticated but common enough to point that dromedaries were not extremely rare. An important case in point is a hollow terracotta camel from the British Museum, modelled in the round, dated to 1st–3rd century CE.¹³³ Characteristically, the artist indicated the details part in relief and part in paint. The head-harness and three girth straps are cut in relief, whereas the load is painted on clay.¹³⁴ The unsophisticated manner of portraying the animal may indicate that artists had few occasions to observe these animals in detail. In contrast, figurines produced in the latter part of the Roman period are more detailed, suggesting – although without any certainty – that contemporary artists spent more time with dromedaries. They were able to observe the animals and their loads and thus to render them in detail. A proper example would be a terracotta figurine of a camel carrying transport amphorae, dated to the mid-Roman period, late 2nd–early 3rd century CE.¹³⁵ The artist faithfully renders in clay relief the typical features of dromedaries with four transport amphorae on its back. Such terracottas corroborate the papyri and ostraca records and indicate that, by the mid-Imperial period, camels were fairly common in Egyptian transport and specific loading strategies had been devised to allow them to bear heavy transport amphorae safely.

Some camel terracottas can be traced to specific locations. Céline Boutantin researched their spatial distribution and hypothesised the demand for such figurines could be higher in the Nile Valley villages through which camel caravans passed on their way to the desert. If camels were present at a particular site, the locals could produce them locally for profit in large quantities, as camel handlers would probably buy such camel effigies as lucky charms.¹³⁶ Boutantin stressed the numbers of figurines found at such sites do not always support her hypothesis. For instance, we know that

Oxyrhynchus was the site from which desert trails led to the Small Oasis, but two figurines found there obviously do not suggest they were mass produced at this site.¹³⁷ Conversely, Boutantin's hypothesis is more tenable for Coptos, a Nile city from which trails led to the Red Sea ports Myos Hormos and Berenike. In Coptos excavations led by A. Reinach, 170 zoomorphic figurines were excavated. Of them, 66 were dromedaries and 55 were horses.¹³⁸ Such a large proportion of animals used in desert transport corroborates the hypothesis about local production and reflects the main commercial activity of the site, which was to provision caravans and soldiers braving the desert between the Nile and the Red Sea.¹³⁹

In sum, artistic depictions – drawings, incisions, graffiti, terracottas, and other works of art – provide us with valuable insight about types of loads and cargo camels carried. Sadly, works of art often cannot be dated with precision;¹⁴⁰ moreover, occasionally, one cannot easily distinguish whether depicted animals were wild or tamed, used for short-distance transport or for longer desert travels.¹⁴¹ Therefore, it is more prudent to rely on written sources, such as trade and sales receipts, which often can be dated with great precision and contain a wealth of information about the animals, their loads, and prices. As for the archaeological sources, the camel bones found beyond the Nile Valley and oases suggest deceased animals were long-distance desert carriers. When animal remains are in the vicinity of pottery assemblages – as is often the case – it is relatively easy to gauge the approximate date of the animal's demise.¹⁴² However, these fragmentary bone finds are frequently found in disturbed context and have not – to my knowledge – been extensively used to date the spread of camels.¹⁴³

3.2.3. Water and fodder needs

In the Saharan deserts, camels are usually not given fodder by their owners, who rely instead on animals browsing and grazing.¹⁴⁴ In terms of fodder needs and grazing patterns, camels tend to do well in arid areas that receive at least 50 mm of precipitation per annum; they can survive in even drier areas but only for a limited time.¹⁴⁵ Unlike other animals, camels actually stimulate plant regrowth when grazing, a result of their feeding patterns.¹⁴⁶ Dromedaries prefer intermittent grazing on a wide variety of plants. They rarely eat whole plants, preferring to take a mouthful out of every specimen, moving between bites from plant to plant.¹⁴⁷ Foraging for food, camels can move 5 kilometres in two and a half hours, wandering from pasture to pasture, never grazing in one place for excessive amounts of time.¹⁴⁸ Another type of camel behaviour that eases the pressure on the environment is herd spreading. As they feed, camels usually move apart from one another, wandering off in several directions. During droughts, herds separate into pairs or even travel in solitude, lowering the pressure on the already scarce vegetation.¹⁴⁹

In the course of their long, meticulous research on camel feeding patterns, Gauthier-Pilters and Dagg observed that the weight of a camel bite varies, depending on the plant species the animal currently feeds on, the plant's mouthfeel (hard/dry/

prickly), and water content (succulent/desiccated); however, once, these factors are taken into account, the bite weight stays relatively constant in a given category.¹⁵⁰ Gauthier-Pilters and Dagg observed 150 grazing adult camels for 500 hours, at times up to 8 hours per animal,¹⁵¹ estimating and recording bite weight, number of bites per hour, and total feeding times; their meticulous data allows one to gauge how much on average a camel eats when it grazes and does not work strenuously. Their conclusions were as such: an average camel eats 10–20 kilograms of green fodder per day, which translates to 5–10 kilograms of ingested dry matter.¹⁵² When the camels graze on succulent, moist plants, they ingest more of them (ca. 30–40 kilograms) and thus proportionally more dry matter (8–12) but not by a large percentage.¹⁵³ It was thought that a camel requires 30–50 kilograms fresh food per day, but it is speculated this high intake is more appropriate for working animals, such as pack animals.¹⁵⁴ However, the fodder requirements for pack animals might have been overestimated. Gauthier-Pilters and Dagg report, during their research trips in the desert, camels bearing 120 kilograms of load for 30 kilometres a day (average travel time was 6 hours, thus average speed was 5 km/h) lived for four weeks without visible problems on quantities of fodder that amounted to 6–7 kilograms of dry matter ingested per day.¹⁵⁵ The authors also noted that animals worked harder than usual, because camels are not normally ridden for a month without longer breaks. During severe droughts, working camels may be occasionally given limited amounts of supplementary fodder: barley, oats, date stones, corn.¹⁵⁶

In fact, it may be that camels are better adapted to desert fodder scarcity than to rich and watery foods as found in the Nile Valley. The less camels eat, the more they can tolerate extreme temperatures;¹⁵⁷ additionally, dehydrated animals apparently do not lose their appetites.¹⁵⁸ What is more, camels prefer hard, dry, thorny pieces to watery and succulent leaves and show great deftness in picking and slowly chewing such prickly treats. For example, camels show great fondness for hard and spiny species of trees and shrubs, such as acacias (valued for their water content and palatable twigs) and Egyptian myrobalans (due to high protein content). Significantly, when the protein intake of camels is low, or the animal needs extra protein, these animals can overcompensate by lowering the amount of urea excreted in urine.¹⁵⁹ Saved urea is secreted back into the alimentary tract, where it is absorbed by gut flora and used to produce bacterial proteins. These come back into the bloodstream and are reused by the body.¹⁶⁰

Salt plays an important role in camel diet and should be ingested daily to resupply losses in sweat. Minor salt deficiency causes muscle cramps; prolonged salt deficiency in camels may cause skin necrosis and arthritis.¹⁶¹ Intake guidelines vary from 45 to 140 grams daily; most of that amount is ingested when camels eat desert halophytes, such as saltbushes, small plants that thrive on salty soils and store salt in their tissues.¹⁶² Camels exhibit extraordinary fondness for saltbushes, being able to ingest up to 6 kilograms of saltbush per hour; where saltbush does not grow on camel grazing grounds, salt supplementation should be introduced to keep animals healthy.¹⁶³

Camels are generally known for their low water requirements and their ability to go for long periods without drinking; however, measuring exactly how much water an adult camel needs a day was proven extremely difficult, with various authorities on the subject providing divergent estimates. For instance, it has been claimed that camels in summer need to drink once a week¹⁶⁴ or every fifth day,¹⁶⁵ unlike donkeys, which have to drink every two or three days.¹⁶⁶ Gauthier-Pilters and Dagg have summarised the contradictory estimates on camel water intake in the following manner:

How often a camel needs to drink depends on its age, the work it is doing, the humidity, the environmental temperature (both day and night), and the quality, quantity, and water content of its food. Generalizations about water requirements, therefore, have little value.¹⁶⁷

Thanks to their thorough research into the matter, Gauthier-Pilters and Dagg have largely discovered to what degree the aforementioned factors influence the frequency of drinking. The authors observed 600 animals in all age groups and in different pasturage conditions, measuring individual water intakes 800 times, with some animals observed more than once.¹⁶⁸ In temperatures reaching or exceeding 40 degrees, 6 per cent of animals drank between 100 and 135 litres per their first drinking session, with the first drink of the day providing 80–90 per cent of water drunk per day for well-nourished animals and up to 70 per cent for animals that were dehydrated or undernourished.¹⁶⁹ Such dehydrated animals often have to imbibe water into two or three sessions, with most going for a second and only a minority of the weakest camels going for a third.¹⁷⁰ Those drinking only once are in exceptional shape, as they are able to hydrate so efficiently it leaves them more time for grazing.¹⁷¹ In contrast, weaker animals cannot imbibe large quantities of water at once. They need more time to rehydrate and drive water into tissues, and they drink less per watering session.

One factor that influenced the frequency of watering was the ambient air temperature. During the winter season in the Sahara (which lasts from six to seven months), camels drink very little water and can walk for several days in the desert, receiving enough water from succulent plants they ingest.¹⁷² In the slightly warmer period, when temperatures range from 30 to 35 degrees Celsius, camels need to drink every 10 to 15 days.¹⁷³ The estimates of 5 to 7 days are therefore correct only for the (relatively short) hottest period in the year, when temperatures soar above 40 degrees Celsius.¹⁷⁴ In the heat of high summer and when given unrestricted access to water, camels tend to drink every 4–5 days *ad libitum*, although exact frequency depends on the water content of fodder and whether the nights are cool; in the Sahara, radiation loss of heat in the night is so significant that, oftentimes, nights are much cooler than days and provide some respite from the day's heat.¹⁷⁵ When night temperatures fall below 20 degrees Celsius, camels can occasionally go for two weeks without drinking, although such breaks between watering are slightly uncomfortable for them.¹⁷⁶ According to the authors, the rule of thumb is that free-grazing camels in summer might be watered every 8 days without any detriment to them.¹⁷⁷

Load-bearing camels do need more water, and they drink more frequently. Gauthier-Pilters and Dagg measured water intake of camels that walked for 30 kilometres a day and bore 120-kilogram loads in high heat.¹⁷⁸ When given water *ad libitum*, camels drank every two days; when amounts imbibed were halved, the result was from 10 to 20 litres per day for one animal. In cooler weather, the observed camels drank just as often, but less, averaging 8 litres per day for one animal. In turn, when fodder intake was limited, and water was given to camels once every 8 days, their water intake slightly increased but not to a large degree. When the amounts imbibed were divided by 8, the resulting daily water requirement was 16 litres a day.¹⁷⁹ Surprisingly, when camels graze on succulent, watery plants, they tend to drink more – up to 20–30 litres a day in summer; in extreme heat, the intake might occasionally reach 45 litres a day.¹⁸⁰

In sum, camels walking for 3 to 5 hours in high summer heat usually need from 20 to 30 litres of water a day, with elderly and lactating females drinking more than that. When the food is scarce and the heat extreme, these animals often conserve water so efficiently that – even after 10–16 days without water – they drink no more than 6 to 8 litres per day.¹⁸¹ The lessened intake of water proves their ability to regulate their water intake according to environmental pressures, with camels drinking less water when the resource might be getting scarce.

Camels can lose a large percentage of their weight in water before the onset of dehydration. Conservative estimates claimed severe dehydration begins when water losses exceed 20 to 25 per cent of body weight;¹⁸² in contrast, Gauthier-Pilters and Dagg found that camels that went 5 to 7 days without drinking customarily drank about 150 litres afterwards.¹⁸³ Specimens weighing ca. 500 kilograms drank up to 200 litres, amounts pointing to the fact that these animals routinely lose up to 40 per cent of their body weight in water without any detriment to their health.¹⁸⁴ Camels drink less when dehydrated.¹⁸⁵ In high temperature, camels going four days without water start limiting their water intake when finally allowed to drink. After a week without drinking, their water intake is halved.¹⁸⁶ Significantly, even thirsty camels will refuse to drink muddy or polluted water.¹⁸⁷

Another point of interest is the effect undernourishment has on camel water intake. Undernourished camels drink much less than well-nourished ones, but they drink somewhat more often. Such animals are unable to drink more than 20 to 25 per cent of their weight in water.¹⁸⁸ In contrast, well-fed animals tolerate drought better and can drink up to 40 per cent their weight in water when finally allowed to drink.¹⁸⁹

Considering their predilection for salt, it is no surprise that camels can rehydrate by drinking brine. Camel kidneys are extremely effective at filtering soluble salts; nonetheless, dromedaries given water containing from 0.25 to 5.5 per cent of sodium chloride tend to drink, eat and urinate more. Camels can subsist on a diet consisting of dry hay and water containing 5.5 grams of salt per litre for several days, an exceptional ability among other ruminants.¹⁹⁰

3.2.4. Acceptable loads and marching distances

Analogically to water intake estimates, there is no agreement on how much a camel might comfortably carry on its back on a daily basis; however, weights given usually situate in a relatively narrow range of 200–300 kilograms. Due to the convexity of its back, a camel can bear more than a horse, but it cannot rise when the load is too heavy or ill-balanced.¹⁹¹ Nomads make their camels bear loads not exceeding 150 kilograms, but camels can occasionally bear 300 kilograms for short distances.¹⁹² In the military, French camels bore up to 150 kilograms and British ones up to 200 kilograms.¹⁹³ The heavier the camel, the more it can bear. 600-kilogram specimens can carry from 200 to 325 kilograms for several kilometres and 475 kilograms for a short distance.¹⁹⁴ According to Groom, camels can carry up to 325 kilograms in normal conditions.¹⁹⁵ However, the load must be properly distributed, because the hump cannot bear much weight and it will deform if stressed.¹⁹⁶ Moreover, the load must be such that a camel will be able to rise to its feet.¹⁹⁷ Taking into account all said above, it is understandable that loads born by camels in the Roman Egypt varied. Camels loads recorded in the Fayum customs house were twice as large as donkey loads, with an average camel bearing 6 artabas of grain or about 180 kilograms, with some camels occasionally bearing up to 550 kilograms for very short distances.¹⁹⁸

When camels carry loads weighing between 270 and 300 kg, they can cover from 26 to 80 kilometres a day, with fastest camels occasionally covering from 150 to 180 kilometres a day in specific circumstances;¹⁹⁹ on one occasion, a 300-kilometre distance between Cairo and Gaza was covered in two days.²⁰⁰ The pace of walking camels varies. At a slow pace, camels cover from 7 to 9 kilometres per hour; a lightly loaded camel can sustain this pace for 10–20 hours without much exhaustion.²⁰¹ The speed of 10–12 kilometres per hour is classified as a medium pace. In turn, a fast pace in camels equals 16–20 kilometres per hour, with maximum speed of 25 kilometres per hour; however, a camel can move that fast only for an hour or two.²⁰²

Similarly to donkeys, camels have certain requirements in regard to the surface on which they are to march; they have evolved to walk on sand and exhibit several adaptations to such an environment:

Although the camel belongs to the order Artiodactyla, whose other ruminating members all have cloven hooves, the camel's feet are not hooves but rather large pads with two anterior toenails. [...] Both are large, which helps prevent the camel from sinking deep into soft sand. [...] The sole of the foot is thick and flexible enough that the camel can step without much discomfort on small pebbles, but it prefers to follow winding trails where there are no loose stones. Camels are almost helpless in mud, but their feet are not adapted to rough, hard ground either; if they have to walk long distances on such surfaces, their soles may crack and bleed so that leather patches have to be sewn over them for protection.²⁰³

Unlike rock-preferring Bactrians, dromedaries show preference for sandy ground.²⁰⁴ This difference between donkeys and camels hints that, in the period when camels were becoming more popular, the desert tracks must have changed to accommodate

for pack animal surface preferences. Tracks that previously led through rocky and mountainous areas and closely followed water sources now went through waterless sandy playas and ergs, with camels being able to traverse arid wastes for several days without drinking. Understandably, previously remote locations could now be reached in shorter periods.

3.2.5. *Significance: disputed (excursus: Abu Ballas Trail)*

Being more resilient and less water-dependent, camels probably became the most important means of long-distance desert transport in Roman Egypt.²⁰⁵ However, they never completely replaced donkeys, as there were specific situations where these equids performed better;²⁰⁶ for instance, I mentioned earlier that donkeys were predominantly used as pack animals in the Eastern Desert quarries.²⁰⁷ Surprisingly, there are scholars who downplay the significance of camels and argue for the post-Roman date of their use in long-range desert travel; for instance, Köpp defiantly ignores the sheer number of testimonies about camels in papyri and ostraca, arguing camels played only a marginal role in Roman Egypt.²⁰⁸ In light of literary and archaeological data, such unsubstantiated positions cannot be defended.

Now to return to the most interesting part: why did introducing camels to the desert trade in Egypt make caravans reroute their tracks? There are two possible explanations, one connected with ground preferences of these animals, another with their watering needs. As I mentioned, donkeys prefer hard, rocky ground on which they can file their constantly growing hooves; however, their hooves must also be periodically moistened to prevent cracking. In contrast, dromedaries prefer shifting sands with no water under their hooves. Specific demands of donkeys made the caravans pick rockier and more rugged sections of the desert, albeit ones where water can be found regularly. Dromedary caravans shifted to sandier parts of the Egyptian deserts, removing the need to water animals every second or third day.

Watering needs of animals were another crucial factor. Donkeys need to drink every 48 or 72 hours; if fed colocynths (*Citrullus colocynthis*), wild melons abundantly growing at the Saharan margins, they can last up to four days without water, as these juicy fruits can slake animal thirst up to a degree.²⁰⁹ Where colocynths are unavailable, donkey caravans have to rely on wells and waterholes. As a result, the donkey caravan has to proceed slowly from an oasis to an oasis, from a well to a well, from a waterhole to a waterhole, often in an indirect and winding way between the starting point and the target. In the Old Kingdom period, Egyptians realised that donkey caravans may be reliable, but they tend to pick the longer route due to the fact animals have to drink every few days.

To shorten desert crossings, ancient Egyptians created what may be termed the first travel infrastructure installations in the desert along the so-called Abu Ballas trail, which linked Dakhla Oasis to Gilf Kebir plateau. 'Large storage jars were used to establish [...] a series of water depots at more or less regular distances along a straight route'²¹⁰. When a donkey caravan was to cross the depot trail, a preparatory

expedition, usually consisting of Oasis dwellers, carried water skins to depots and refilled the storage jars for future use by the caravan. Occasionally, separate pots were left for donkey fodder. Thanks to these installations, when a larger caravan had to follow the Abu Ballas trail, such pottery lines enabled donkey caravans to cross about 400 kilometres through barren, extremely arid desert regions.

Moreover, it is worth mentioning that the Abu Ballas trail was established with donkey surface preferences in mind. Travelling from Dakhla Oasis to Gilf Kebir, one crosses the Nubian Sandstone formation, with its alternating layers of 'soft and hard sandstone sediments and rocks', which translate into sandy and rocky areas in terms of surface cover.²¹¹ The Abu Ballas Trail is roughly half and half in terms of sand/stone ratio. It runs relatively straight, meandering only to bypass escarpments by turning into cut valleys or using ravines to climb cliffs. Interestingly, it appears the direct run of the Abu Ballas trail has the highest rocky terrain ratio of all possible alternatives.²¹² Sand dunes of the Great Sand Sea to the north and Selima Sandsheet to the south would make it difficult for the donkeys to cross them; hence, a terrain with the most donkey-friendly surface cover possible was chosen for the trail.²¹³

How does this influence my search for desert trails? First, such portable ceramic objects as pots left along the Abu Ballas Trail were integrated as 'fixtures' in the 'site furniture', thus clearly marking the extent of the trail.²¹⁴ Pots are conspicuous and durable; therefore, any two sites in the vicinity that share the same ceramic material may be gauged to have been used in roughly the same period. Because the pottery trails tend to follow straight lines, it is relatively easy to track their run. Moreover, because the pottery trails were frequented by donkeys, they often cover rocky and coarse ground with a gravel surface. Thousands of donkey hooves walking on gravel move the surface material aside to carve out very distinct grooves, which are at times visible even from space. By comparing satellite images, one can locate many oft-frequented tracks.²¹⁵

In this context, the introduction of camels stands for a crucial event for my research. It certainly eased the travel hardships, but it made it more difficult to track the caravan lines. Camels need to drink every five or seven days, therefore, they do not need to follow water sources as closely as donkeys do. If we take into account the fact that camels can subsist without water for even longer periods than one week, it becomes clear that camel caravans might cross the desert directly, without visiting waterholes or wells; in their daily marches, they go much farther than donkeys, yet they leave much less archaeological material. No pottery lines were necessary. In fact, the Abu Ballas trail appears to have been only sporadically used once camels took over.²¹⁶ We know that desert trails shift in that period, as camels want to walk on sandier parts of the deserts;²¹⁷ unfortunately, camel tracks left in shifting sands are obliterated almost instantly, leaving behind no discernible grooves to follow.

The introduction of the camel therefore marks the moment when caravans become less visible in the archaeological landscape of the desert; nonetheless, 'less visible' does not denote 'invisible'. One might enumerate at least two under-researched

types of archaeological material that may be used to trace camel caravans in the archaeological strata of the desert in future studies – that is, camel bones and ribbed Late Roman vessels; yet, it should be noted that both types of material are somewhat uncommon and pose certain interpretational problems. Camel bones – as mentioned – were left in the desert when the animal got injured or sick and had to be left behind.²¹⁸ Proper studies of such ecofacts would provide us with a wealth of data on desert travel in the later Roman period; regrettably, few camel bones found in the Egyptian deserts were osteologically studied, and none have been dated with radiocarbon methods.²¹⁹

Recent surveys have also uncovered a small number of ribbed kegs that were turned on a kick wheel, with their remains tentatively dated to the Late Roman period.²²⁰ Unfortunately, obstacles such as incomplete vessel typologies, lack of discernible distribution patterns, and small reference pools impede further studies of such vessels.²²¹ At present, all analysed fragments of ribbed vessels were found in the vicinity of Dakhla Oasis. A small number of pieces were uncovered at an Abu Ballas site of Jaqub 00/23, 173 kilometres southwest from Balat (Dakhla);²²² similar remains were found at site 02/44, 8 kilometres north of Balat.²²³ The latter site is one of very few spots where camel bones were preserved in the context of ribbed pottery assemblages. Site 02/44 is located at the extremely steep, rocky slope, where the local trail descends from the scarp surrounding the Dakhla Oasis and follows south to Balat.²²⁴ The rough terrain was not suitable for loaded camels. One of the animals tripped and perished in the resultant landslide, dispersing parts of its load. Two Late Roman pottery pieces and a dromedary radius/ulna bone were found buried in gravel below.²²⁵

Rare sites, such as 02/44, indicate camels were definitely used as desert carriers in the Late Roman period in the area of Dakhla Oasis, but they did not outnumber humble donkeys; tellingly, at Mons Claudianus sites, finds of donkey bones are seven times as numerous as the finds of camel remains.²²⁶ Relatively small numbers of camels, their considerable independence from existing water infrastructure, and preference for sandy ground does hinder efforts at discerning the camel trails of the desert. In the same vein, pots tentatively associated with the Late Roman period are not trail fixtures in the sense of earlier water storage jars. Typical desert roads in Egypt can be distinguished in the desert environment by large amounts of pottery fragments strewn along road edges;²²⁷ hence, a road may be understood as a continuous line in the ceramic material of the desert, with pottery shards dated to the same period occurring in regular intervals along its course. Few and far between, uncovered ribbed Roman vessels show erratic distribution patterns. They occur only incidentally in the road material of Abu Ballas trail and appear almost entirely out of the road context in the vicinity of Dakhla. As such, they cannot point with any certainty which desert trails were frequented in the Roman period; hopefully, future advances in satellite imaging, camel osteology, and pottery typologies will provide us with more data on early dromedary use in the studied area.

3.3. Oxen

3.3.1. General information

Known in Egypt since its beginning, cattle (collectively classified as *Bos taurus*) were one of the land's most popular and revered animals. Not very fast, but resilient and dependable, they typically performed tasks where strength was of essence, primarily used as draught animals and beasts of burden.²²⁸ Egyptians probably raised several varieties of cattle, with artistic depictions and osteological remains suggesting the four following species were of the greatest importance: Sanga cattle (*Bos taurus africanus*), with slender limbs and long, curved horns (1); humpless shorthorns (*Bos taurus brachyceros*) (2); unidentified humpless polled (hornless) cattle (3); and finally humped shorthorns known as zebu (*Bos indicus*), imported from Asia during the New Kingdom period.²²⁹ Importantly, differences in horn length do not always allow one to identify the depicted species properly. Horns of longhorn cattle bred in humid areas, such as the Valley, Delta, and oases, will progressively shorten over generations, with longhorns eventually resembling shorthorns.²³⁰ Such natural variations of phenotypes might explain ancient depictions of shorthorns, drawn in times when the true shorthorn cattle probably had not yet arrived in Egypt.

3.3.2. Date of introduction to Egypt and history of use

The history of cattle in Africa is better known than that of any other domestic species; it is also very complicated [...] because for at least three thousand years the continent has been a melting-pot for unhumped cattle (*Bos taurus*) brought in from Eurasia and humped cattle (*Bos indicus*) brought in from Asia, in particular from India. In addition, it is possible that cattle were locally domesticated in North Africa from the endemic wild aurochsen (*Bos primigenius*).²³¹

Wild cattle species classified as now-extinct aurochsen (*Bos primigenius*) roamed northeastern Africa at least since the Upper Palaeolithic (ca. 35000–20000 BCE), with their osteological remains found at some Egyptian and Sudanese sites. Digs in the vicinity of Wadi Halfa at the Sudanese-Egyptian border produced bones dated to periods ranging from the Upper Palaeolithic (35000–20000 BCE) at the earliest to the Late Neolithic at the latest.²³² At a site in Fayum, aurochs remains appear in many strata, first surfacing in layers dated to the Epipaleolithic period (ca. 20000–10000 BCE) and making their last appearance in strata from the Late Neolithic period (ca. 6000–3000 BCE), with isolated and inconclusive finds pointing to some specimens possibly surviving until the Early Bronze Age.²³³ Tentatively identified aurochs remains from Dakhla Oasis are roughly contemporaneous with Fayum finds, no longer found in strata following the Late Neolithic period.²³⁴ Accordingly, the beginning of the Early Bronze Age in Egypt appears to mark the extinction of aurochsen in the land. Before dying out, aurochsen were independently domesticated in the Near East and in the Indian subcontinent, two divergent bovine populations evolving in the long run into Eurasian humpless taurine cattle (*Bos taurus*) and humped zebu cattle (*Bos indicus*).²³⁵

How and when these emergent species were introduced into Egypt is still argued, with researchers disputing whether Egyptian cattle descend from auroch stocks domesticated in Europe and Asia and only subsequently brought into the Nile Valley, or perhaps they come from indigenous African aurochs stocks domesticated in Egypt. The conservative model of cattle species migration argues for an early movement of Eurasian and Indian cattle stocks into Africa. Egyptian cattle are thought to descend from bovines that moved along the Nile Valley into the interior or were introduced from Nubia, arriving from Asia via the Horn of Africa and then through the Upper Nile Valley.²³⁶ This conservative model has two taurine species arrive in Egypt in succession. The humpless Hamitic longhorn (*Bos taurus longifrons*) is believed to have appeared in Egypt ca. 5000 BCE, purportedly followed by a humpless shorthorn (*Bos taurus brachyceros*) ca. 2500 BCE. Humpless shorthorns gradually began to outnumber longhorns, with stocks imported from Asia by pharaohs after conquests and by immigrants coming into Egypt.²³⁷ Humped shorthorns in Egypt were represented by zebu (*Bos indicus*), which ostensibly arrived in larger numbers ca. 1500 BCE.²³⁸ Followers of the conservative model argue Sanga cattle (*Bos taurus africanus*) – a slender-limbed species of intermediate horn length known from Egyptian artistic depictions – were hybrids of long- and short-horned cattle, bred after 1500 BCE, when all parent cattle species were well-established in Egypt.²³⁹

In contrast, a newer autochthonous model developed by Grigson amends the conservative cattle migration model in that Sanga cattle is thought to be an indigenous African species that used to have a broader geographical distribution in Africa; it was only in the 19th and 20th century when cattle diseases, such as rinderpest, decimated Sanga herds to such a degree that African breeders had to replenish their stocks with taurine and zebu specimens, in effect diluting the Sanga bloodline and masking their autochthonous origin.²⁴⁰ The autochthonous model gains credibility when one considers evidence coming from artistic cattle depictions in Egypt and genetic research. Artistic depictions of animals resembling Sanga cattle appear in Egyptian rock art dated to 5000–4000 BCE,²⁴¹ making them one of the earliest cattle breeds known to inhabitants of Egypt; moreover, current research in bovine genetic lineages indicates wild aurochs herds roamed Africa for at least several thousand years, and first domesticates probably came from these indigenous stocks,²⁴² although it is certain they were crossbred with imported Eurasian specimens at some point.

It has been forcefully argued by a vocal subset of scholars that cattle might have been domesticated in northeastern Africa in the Early Neolithic, ca. 9000 BCE;²⁴³ nonetheless, all the studies conducted so far suffer from the fact that no Early Neolithic bone samples found at Egyptian sites show signs of osteological changes associated with domestication, such as gradual size decline.²⁴⁴ In contrast, equivalent Late Neolithic (5500–4600 BCE) remains exhibit such changes thus came ‘beyond doubt (from) “good” domestic cattle’.²⁴⁵ Interestingly, extinction of aurochsen roughly coincides with the first appearance of remains of domestic cattle in the archaeological

material. Around 5000 BCE, inhabitants of Dakhla Oasis belonging to the Bashendi A cultural unit herded cattle that left bone remains showing tell-tale signs of breeding for domestication.²⁴⁶ Inconclusive osteological finds indicate a small population of wild aurochs might have still lived at Dakhla at this period;²⁴⁷ therefore, Dakhla could be one of the areas where wild aurochs, herded by local inhabitants, fluidly evolved into domestic cattle over several generations. It is possible that domesticated cattle might have sporadically gone feral. Puzzling references to New Kingdom pharaohs hunting aurochs probably refer to these specimens.²⁴⁸

3.3.3. Water and fodder needs

In comparison to camels and donkeys, cattle require much water and fodder to thrive in a desert environment while working. An ox usually eats from 12 to 15 kilograms of fodder and drinks from 100 to 150 litres of water every day,²⁴⁹ with rations growing larger in climatic extremes. In comparison, donkeys will ingest only about a third of the amount eaten by an ox, and camels will eat roughly as much as an ox; it should also be emphasised that camels usually satisfy their food requirements by browsing in the desert and do not need to be fed by their handlers. Donkeys usually drink from 10 to 18 litres of water per day, being able to go up to three days without water. Camels drink almost as much as oxen, but they need to drink only every five to seven days. Conversely, oxen easily succumb to dehydration and should be watered daily or at least every second day.²⁵⁰

3.3.4. Acceptable loads and marching distances

Oxen can pull and bear loads, although they are more suitable for draught work. They're efficiently influenced by weather conditions, surface of the ground to be covered, and load weight.²⁵¹ It has been roughly estimated that a pair of oxen in ancient Egypt could pull a four-wheeled wagon weighing around 670–700 kilograms (350 kilograms per animal) with a speed of 3.2 km/h;²⁵² however, no controlled studies have revised these estimates.²⁵³ A maximum daily distance covered by oxen varies from 15 to 30 kilometres,²⁵⁴ with animals tiring faster in desert heat.²⁵⁵ No data were recorded for oxen load-bearing capacity. It is thought to be much smaller than their draught power.

3.3.5. Significance: marginal role in desert transport

From the Pre-Dynastic period to the Roman period, oxen were the most popular transport animals, progressively used for almost all types of good transport, except for load bearing – a natural consequence of oxen preferring to pull loads rather than to bear them.²⁵⁶ Indeed, only the wall paintings of the 6th dynasty tomb of Niankhpepikem at Meir depict an ox carrying goods, the sole representation of an ox as a pack animal in the art history of ancient Egypt.²⁵⁷ Whether oxen were used in draught work in the desert remains an open issue. A preserved expedition text from the reign of Ramesses IV mentions oxen-driven wagons loaded with supplies for workers in the

Wadi Hammamat region.²⁵⁸ As oxen were often used in heavy transport and quarry work in the ancient Mediterranean, some scholars claimed they must have laboured in Mons Claudianus and Mons Porphyrites quarries in the Eastern Desert;²⁵⁹ nonetheless, no bovine osteological remains were unearthed in the vicinity of the quarries, with transport documents similarly being conspicuously silent on oxen use in draught work.²⁶⁰ It can be safely argued that large fodder and water requirements made oxen largely unsuitable for quarry work in the Eastern Desert; in the same vein, their negligible load bearing capacity was the reason they probably were never used as pack animals in the desert environment – or any Egyptian environment for that matter.

3.4. Horses

3.4.1. General information

The horses (*Equus ferus caballus*) of Africa are classed into three groups: Oriental, Barb, and Dongola, with some authors also mentioning ponies;²⁶¹ of these types, the Oriental is of the greatest importance and is found in great numbers in Egypt, with Barbs and Dongolawi groups often separately treated as so-called Occidental types. Oriental horses are often described as harmoniously proportioned, elegant and spirited. Universally praised for their strength and endurance, they were the first horse type introduced to Egypt. Differences in build and disposition point to a radically different origin of Oriental and Occidental types. It is thought that Barbs and Dongolawis in Africa originally came from Iberian horse stocks, imported by Carthaginians, Romans and Vandals.²⁶² Barbs and Dongolawis quickly spread through the Saharan hinterlands in the 1st millennium CE, with Barb and Dongolawi likenesses appearing in the rock art of Central (Barbs) and Eastern Sahara (Dongolawi).²⁶³ Barbs – tall, coarse-bodied horses with elongated limbs – stand in direct contrast to muscular, powerful Orientals. Less suitable for riding, they are often used for local farm work.²⁶⁴ Dongolawi horses are distinguished by their large size, narrow foreheads, convex facial profiles, long manes, full tails and steep shoulders.²⁶⁵ Less graceful than Orientals or Barbs, they were slower and slightly less useful than these breeds;²⁶⁶ nonetheless, they were greatly prized as status symbols by medieval Nubian aristocrats, who used Dongolawi horses in their cavalry.²⁶⁷

3.4.2. Date of introduction to Egypt and history of use

When exactly horses were introduced to Egypt remains an issue almost as mysterious and convoluted as the date of introduction of camels.²⁶⁸ The earliest physical remains of horses in Egyptian soil – bones and teeth – were found at sites of Tell el-Dab'a and 'Esbet Helmi (ca. 1600 BCE), Tell Hebua (Second Intermediate Period, ca. 1786–1552 BCE) and Buhen (ca. 1675 BCE or later).²⁶⁹ The Buhen site dig in a ruined Late Middle Kingdom fortress produced a skeleton of a nineteen-year-old Oriental, buried in a stratum very tentatively dated to 17th century BCE at the earliest.²⁷⁰ After these finds, horses briefly disappear from the Egyptian archaeological context to resurface in

18th dynasty, when a five- or six-year-old Oriental was put into a spacious coffin and left around 1500–1465 BCE in a Deir el-Bahari tomb dedicated to Senenmut, queen Hatshepsut's favourite.²⁷¹

Written records of Oriental horses begin to appear from the end of the Hyksos invasion, with Egyptians treasuring horses and their chariots as status symbols and futilely trying to raise them domestically in numbers that would obviate the need for imports.²⁷² Inhabitants of Egypt saw horses as fitting war prizes to be won from their Near Eastern adversaries: during the battle of Naharin near the Euphrates, one general conspicuously seized an enemy chariot and a steed that drew it and another one a chariot with steeds and their charioteer.²⁷³ Under Thothmes III (1490–1436 BCE) the number of horses in Egypt steadily increased, bolstered by horse tributes from Assyrian kings and purchases from Phoenicians.²⁷⁴ Nevertheless, Egyptian horse supply could not satisfy internal demand; hence, the capture of 924 good chariot teams (2238 horses) after the battle of Megiddo (1480 BCE) was a cause for celebration.²⁷⁵ During Ramesses II's reign (1290–1224 BCE) efforts towards domestic horse breeding were intensified with meagre results, mostly due to unfavourable climatic conditions. Breeding Oriental horses in the damp Valley produces inferior offspring, regularly long-legged and weedy;²⁷⁶ in contrast, Mediterranean littoral areas and pre-desert zones south and west of Egypt might have been better suited for horse breeding and pasturing.²⁷⁷ No matter how many horses these more favourable areas could have sustained, it was still not enough for domestic needs: horses of the superior Oriental stock were continuously imported to Egypt from the lands of Cilicia and Sangar, a location today identified with southern Kurdistan.²⁷⁸

Horses in Egypt were primarily used for riding and driving chariots.²⁷⁹ Egyptians occasionally did ride horses in the arid desert, if a fast, reliable mean of transport was necessary and water could be procured in sufficient quantities. For instance, a record of a Ramesses IV mission to Wadi Hammamat region in the Eastern Desert mentions 50 chariots participating in the expedition.²⁸⁰ In turn, Farshut Road near Qena Bend in the Western Desert was specifically known as the road of the horses: Darnell speculates it was an express route for messengers, quoting Diodorus on horse relays travelling between Memphis and Western Thebes.²⁸¹

3.4.3. Water and fodder needs

The standard amount of hay given to camels, horses and mules in Roman Egypt appears to have been 12 bundles, which translated into 540 drachma expenditure every year; however, it must be noted that horses both drink and eat more frequently than either camels or mules, which substantially raises the cost of their upkeep and makes them the most expensive pack/draught animals of Egypt.²⁸²

3.4.4. Acceptable loads and marching distances

Similarly to oxen, horses exhibit considerable draught power, but only limited load-carrying capacity: a horse can carry somewhat more than a donkey (170 kg for horse

vs ca. 100 kg for donkey), but their large water and fodder put them at a disadvantage with donkeys.²⁸³ Horses do well when performing tasks requiring speed, such as relaying messages or driving chariots; however, their fast pace can only be maintained with frequent watering and little to no load. Consequently, a horse's spirited gallop is in a manner an exact opposite of a donkeys' slow, steady walk at a steady pace of 4 km/h. Donkeys bear burden well and can carry it for long distances, whereas a cantering or galloping horse easily tires and has to be rested or changed. When one realises that an expensive camel can bear up to 300 kilograms and walk with this load for about 50 kilometres, it becomes understandable why horses were only used in the desert transport in very specific circumstances.

3.4.5. Significance: only rarely used in desert transport

In light of horses' very demanding fodder and water requirements, it is not surprising that they were usually used in very specific contexts in the Roman Egypt: we know of horses utilised as patrol and riding animals in the military and otherwise employed for drawing circus chariots and carriages. Records of civilian horse sales and imports only rarely appear in the papyrological material; in contrast, horses are frequently mentioned in military documents and appear to have been used in large numbers in the Roman army in Egypt and beyond.²⁸⁴ Their large price and prestige attached to their ownership ensured that animals used in transport were usually those that were too old or weak for the uses enumerated above.²⁸⁵ Young, fit messenger and chariot horses regularly crossed the Egyptian desert, but they were considered to be too valuable to be used as beasts of burden; conversely, older and less agile animals would never last long in the harsh desert environment, with their large fodder and water requirements.

Notes

- 1 Förster *et al.* 2010, 56.
- 2 Beja-Pereira *et al.* 2004, 1781; Förster *et al.* 2013, 194.
- 3 Beja-Pereira *et al.* 2004, 1781.
- 4 Beja-Pereira *et al.* 2004, 1781.
- 5 Förster, Reimer and Mahir 2013, 195.
- 6 Förster, Reimer and Mahir 2013, 195.
- 7 Förster, Reimer and Mahir 2013, 195.
- 8 Oudman 2003, 10.
- 9 Förster, Reimer and Mahir 2013, 195.
- 10 Oudman 2003, 9.
- 11 Winkler 1938, 8, 20–21; Dent 1972, 28; Beja-Pereira *et al.* 2004, 1781. Predynastic drawings in Wadi Abu Wasil depict burdened donkeys being driven.
- 12 Brewer, Redford and Redford 1994, 99. Osteopathologies caused by carrying of heavy weights do appear in Egyptian donkeys' bones ca. 3000 BCE and were instrumental in determining the age of their domestication. Cf. Rossel *et al.* 2008.
- 13 Brewer, Redford and Redford 1994, 99.
- 14 Winkler 1938, 8; Dent 1972, 26–27;. Rock drawings in Wadi Abu Wasil surveyed by Hans Winkler show inhabitants of the Eastern Desert hunting wild donkeys as early as 6000 BCE. In the same

vein, earliest wild donkey remains come from remote Middle Paleolithic sites of Bir Sahara and Bir Tarfawi in the Western Desert (Uerpmann 1987, 28).

- 15 Brewer, Redford and Redford 1994, 99. Donkeys were strongly associated with the rural and desert environments; it is only in the later period that they appear in the cities.
- 16 Brewer, Redford and Redford 1994, 99.
- 17 Brewer, Redford and Redford 1994, 99. However, the primacy of desert over the Valley remains disputed, as the Nile Valley material pertaining to the donkey domestication is richer and far less ambiguous. Cf. Förster *et al.* 2010, 94.
- 18 Boessneck and Von den Driesch 1990; Förster, Reimer and Mahir 2013, 194.
- 19 Boessneck, Von den Driesch and Ziegler 1989; Förster, Reimer and Mahir 2013, 194.
- 20 McArdle 1992; Van Neer, Linseele and Friedman 2004; Förster, Reimer and Mahir 2013, 194.
- 21 Rossel *et al.* 2008; Förster, Reimer and Mahir 2013, 194.
- 22 Rossel *et al.* 2008, 3715.
- 23 Rossel *et al.* 2008, 3715–3717.
- 24 Rossel *et al.* 2008, 3715–3720; Beja-Pereira *et al.* 2004, 1781; Köpp 2013, 110.
- 25 Goedicke 1981, 9–10; Obsomer 2007, 41–2; Cooper 2012, 8; Köpp 2013, 110.
- 26 Strudwick 2005, 335–336; Köpp 2013, 110.
- 27 Köpp 2013, 109.
- 28 McDowell 1992, 200.
- 29 Adams 2007, 58.
- 30 Aganga *et al.* 2000; Förster, Reimer and Mahir 2013, 195.
- 31 Schmidt-Nielsen 1964, 81–93; Sidebotham 2011, 91; Aganga *et al.* 2000; Förster, Reimer and Mahir 2013, 195.
- 32 Osborn and Osbornová 1998, 132; Adams 2007, 58; Förster *et al.* 2010, 69; Förster, Reimer and Mahir 2013, 195.
- 33 Maloiy and Boarer 1971, 37; Förster, Reimer and Mahir 2013, 195. Cf. Aganga *et al.* 2000, who give maximum dehydration values in the range of 20–25 per cent.
- 34 Maloiy and Boarer 1971, 37–41; Förster, Reimer and Mahir 2013, 195.
- 35 Förster, Reimer and Mahir 2013, 204.
- 36 Oudman 2003, 22–23; Förster, Reimer and Mahir 2013, 204.
- 37 Förster, Reimer and Mahir 2013, 204.
- 38 Aganga *et al.* 2000.
- 39 Aganga *et al.* 2000.
- 40 Oudman 2003, 15; Förster, Reimer and Mahir 2013, 195.
- 41 Förster, Reimer and Mahir 2013, 198.
- 42 Aganga *et al.* 2000; Förster, Reimer and Mahir 2013, 195.
- 43 Aganga *et al.* 2000.
- 44 Aganga *et al.* 2000.
- 45 Aganga *et al.* 2000; Oudman 2003, 17–18.
- 46 Förster, Reimer and Mahir 2013, 195.
- 47 Förster, Reimer and Mahir 2013, 195.
- 48 Dill 1985, 93–102; Adams 2007, 58; Förster, Reimer and Mahir 2013, 195. Percentages usually depend on individual fitness, age, hydration and other factors.
- 49 Peacock and Maxwell 2001, 297; Köpp 2013, 109–110. Donkey maximum load-bearing capacity in the arid desert drops to only 50 kilograms.
- 50 Oudman 2003, 12; Adams 2007, 57–58; Köpp 2013, 109. In temperate climates, donkeys can carry up to 150 kilograms for a short time.
- 51 Dent 1972, 165; Förster, Reimer and Mahir 2013, 195.
- 52 Wilcken 1899, 754–5; Pearl 1940, 381; Adams 2007, 77–78. Habermann (1989; 1990, 60–61) established that donkeys from the villages of Fayum usually carried loads of 3 artabas (artaba

- ≈ 40 litres) (45.03 per cent), with loads of 2 and 4 artabas also common (respectively 19.21 per cent and 27.82 per cent).
- 53 Pearl 1940, 380–382; Adams 2007, 80.
 - 54 Adams 2007, 78.
 - 55 Förster *et al.* 2010, 63; Köpp 2013, 109–110.
 - 56 Förster, Reimer and Mahir 2013, 204.
 - 57 Oudman 2003, 23.
 - 58 Yousef, Dill and Freeland 1972, 337–340; Förster, Reimer and Mahir 2013, 208.
 - 59 Aganga *et al.* 2000; Förster, Reimer and Mahir 2013, 208.
 - 60 Förster, Reimer and Mahir 2013, 208.
 - 61 Förster, Reimer and Mahir 2013, 208.
 - 62 Förster *et al.* 2010, 54.
 - 63 Förster *et al.* 2010, 59–60.
 - 64 Förster *et al.* 2010, 59–60.
 - 65 Förster *et al.* 2010, 62. The trail saw limited traffic in the Second Intermediate Period (ca. 1800–1500 BCE) and was used again during the reign of 18th, 19th and 20th dynasties (1400–1150 BCE).
 - 66 Hendrickx, Förster and Eyckerman 2013, 359.
 - 67 Gauthier-Pilters and Dagg 1981, 3; Brewer, Redford and Redford 1994, 103.
 - 68 Brewer, Redford and Redford 1994, 103.
 - 69 Brewer, Redford and Redford 1994, 103; Burnham 2002.
 - 70 Burnham 2002.
 - 71 Camillo *et al.* 2003, 380.
 - 72 Brewer, Redford and Redford 1994, 103; Burnham 2002. However, unlike donkeys and horses, Bactrians and dromedaries have the same number of diploid chromosomes ($2n=70$), in contrast to donkeys' 62 and horses' 64. This similarity indicates the extremely close genetic relationship between these two species.
 - 73 Gauthier-Pilters and Dagg 1981, 3.
 - 74 Gauthier-Pilters and Dagg 1981, 59.
 - 75 Gauthier-Pilters and Dagg 1981, 59.
 - 76 Gauthier-Pilters and Dagg 1981, 59.
 - 77 Gauthier-Pilters and Dagg 1981, 59.
 - 78 Gauthier-Pilters and Dagg 1981, 83.
 - 79 Brewer, Redford and Redford 1994, 104.
 - 80 Midant-Reynes and Braunstein-Silvestre 1977, 337–338; Brewer, Redford and Redford 1994, 104; Boutantin 2013, 293–294.
 - 81 Ripinsky 1985.
 - 82 Uerpmann 1987, 52; Osborn and Osbornová 1998, 156.
 - 83 Pachur and Altmann 2006, 499. Remains of *C. thomasi* dated to 40 thousand years B.P. (B.P. = 'Before Present', with 'present' calibrated at 1950 CE) were found in the Nubian Desert: see Gauthier-Pilters and Dagg (1981, 5) and Gautier (1966, 1370–1372).
 - 84 Gautier 1980; Uerpmann 1987, 147; Osborn and Osbornová 1998, 155.
 - 85 Gautier 1966; Uerpmann 1987, fig 18, 159; Osborn and Osbornová 1998, 155.
 - 86 Peters argues for *C. thomasi* evolving into *C. bactrianus* (1997, 1998), *contra* Gautier (1966), who claims *C. thomasi* evolved into *C. bactrianus* and dromedaries came from another *Camelidae* lineage. Gauthier-Pilters and Dagg (1981, 5) and Uerpmann (1987, 52) apparently suggest these two species – no matter if related or not – may have coexisted in some areas and periods.
 - 87 Osborn and Osbornová 1998, 155–156.
 - 88 Gauthier-Pilters and Dagg 1981, 5; Uerpmann 1987, 52; Osborn and Osbornová 1998, 156.
 - 89 Parker and Burkitt 1932, 249–250.

- 90 Other prehistoric or Predynastic depictions of dromedaries in the desert were found at 'Kanaïs in Wadi Mia, 45 km east of Edfu' and at 'Magal Hodein in Wadi Naam, southeastern Eastern Desert' (Osborn and Osbornová 1998, 156; Červíček 1974, 256, 321).
- 91 Conversely, Midant-Reynes and Braunstein-Silvestre (1977, 343) claim that we know too little to assume the inhabitants of the Eastern Desert knew and used camels in the Predynastic Period.
- 92 Midant-Reynes and Braunstein-Silvestre 1977, 338.
- 93 Midant-Reynes and Braunstein-Silvestre 1977, 350–351.
- 94 Ripinsky 1985, 139.
- 95 Pusch 1996, figs 5 and 7; Somaglino and Tallet 2013, 515.
- 96 For many pieces of evidence for the early presence of camel in Egypt see Osborn and Osbornová (1998, 155–156) and Brewer, Redford and Redford (1994, 104).
- 97 Cf. Osborn and Osbornová 1998, 155–156 for a more balanced account on the camel's origins in Egypt.
- 98 Bulliet 1975, 116; Midant-Reynes and Braunstein-Silvestre 1977, 338; Gauthier-Pilters and Dagg 1981, 117.
- 99 Midant-Reynes and Braunstein-Silvestre 1977, 338; Gauthier-Pilters and Dagg 1981, 117; Boutantin 2013, 293–294.
- 100 Midant-Reynes and Braunstein-Silvestre 1977, 338.
- 101 Herodotus, *Histories* 3.7–9.
- 102 Colin 2004, 30–33. Unfortunately, it is not known whether these are imports or locally produced.
- 103 Gauthier-Pilters and Dagg 1981, 117.
- 104 Gauthier-Pilters and Dagg 1981, 117.
- 105 Gauthier-Pilters and Dagg 1981, 117; Adams 2007, 55. Cf. Ripinsky (1985, 135): '[B]ecause of a wetter climate in Lower Egypt, [camel] arrived there after it had reached certain parts of the upper Nile basin'.
- 106 Adams 2007, 50–51.
- 107 Plutarch, *Parallel Lives, Alexander* 37.2; Arrian, *The Anabasis of Alexander* 6.27.6; Quintus Curtius Rufus, *Histories of Alexander the Great* 4.7.12, 5.2.10, 5.6.9, 8.4.19; Adams 2007, 51.
- 108 Rostovtzeff 1922, 107–110; Bagnall 1985, 3; Adams 2007, 51.
- 109 *P.Mich. Zenon* 103; Adams 2007, 51.
- 110 *P.Cair.Zen.* 59835; *P.Lond.* VII 2179; Bagnall 1985, 3.
- 111 Köpp 2013, 111.
- 112 Rice 1983, 200 F, l. 172 and 201 A, l. 175; 92–93.
- 113 Rice 1983, 92.
- 114 Bagnall 1985, 3.
- 115 Pliny the Elder, *The Natural History* 6.26.102; Strabo, *Geography* 17.1.45.
- 116 Fuks 1951.
- 117 Adams 2007, 52–56.
- 118 Nachtergaele 1989, 287–334.
- 119 Young 2001, 57.
- 120 Fuks 1951, 208.
- 121 Littmann and Meredith 1953, 13–14; Young 2001, 58.
- 122 Littmann and Meredith 1953, 16; Young 2001, 58.
- 123 Van Berchem 1952, 67, 85, 87; Littman and Meredith 1954, 241.
- 124 Black [μέλας]: BGU 153; white [λευκός]: SB 9093, BGU 88; fawn [πυρρός]: *P.Lond.* 909a, *P.Lond.* 1132b, BGU 468. See Boutantin 2013, 294.
- 125 Boutantin 2013, 294. Handlers could use either Greek or Arabic markings. The practice of marking is still employed today among nomadic camel owners of Africa: see Gauthier-Pilters and Dagg 1981, fig. 27.

- 126 Boutantin 2013, 294.
- 127 Nachtergaele 1989, 319–320.
- 128 Boutantin 2014, 295; *P.Lond.* 909a [600 drachmas]; *P.Gen* 30 [364 drachmas]; BGU 468 [352 drachmas]; BGU 469 [680 drachmas].
- 129 Boutantin 2014, 295; *P.Gen* 29 [450 drachmas]; *P.Lond.* 1132 b [520 drachmas]; BGU 153 [800 drachmas]; *Stud. Pal.* XXII 30 [820 drachmas].
- 130 Boutantin 2013, 294; BGU 13.
- 131 Boutantin 2014, 295; *P.Grenf.* II 74 (302 CE).
- 132 Boutantin 2013, 292.
- 133 Terracotta 3764; Bailey 2008.
- 134 A hollow terracotta camel dated to the Early Roman period (from 1st to 3rd century CE), the British Museum, terracotta 3764, registration number 1891.0430.31
- 135 Mid-Imperial (Late 2nd–early 3rd century CE) Romano-Egyptian camel terracotta, accession number: 89.2.2093, New York Metropolitan Museum of Art.
- 136 Boutantin 2013, 308–309.
- 137 Boutantin 2013, 308, 312, fig. 193; Nachtergaele 1989, 295, no. 36.
- 138 Boutantin 2013, 308.
- 139 Boutantin 2013, 308–309.
- 140 In case of terracottas, thermoluminescence dating can give an estimate of the date of firing; additionally, pieces of vegetable matter trapped in clay preserve their levels of C14 and are thus suitable for radiocarbon dating. To my best knowledge, these dating methods have not been used to date dromedary terracottas from Egypt.
- 141 Dromedaries carrying sacks, amphorae or panniers classify as pack animals; the range of journey made remains unknown.
- 142 Eichhorn *et al.* 2005, 222–223, 226.
- 143 Eichhorn *et al.* 2005, 222–223, 226. However, new developments in that matter are expected soon.
- 144 Gauthier-Pilters and Dagg 1981, 33–34.
- 145 Gauthier-Pilters and Dagg 1981, 12.
- 146 Gauthier-Pilters and Dagg 1981, 33–34. The only exceptions are trees, for which camel grazing may cause harm. Occasionally, camels may like some trees so much they will continually feed on them, in effect killing the tree; here, the normal overgrazing protection mechanisms fail.
- 147 Gauthier-Pilters and Dagg 1981, 33–34.
- 148 Gauthier-Pilters and Dagg 1981, 33–34.
- 149 Gauthier-Pilters and Dagg 1981, 33–34.
- 150 Gauthier-Pilters and Dagg 1981, 35–39.
- 151 Gauthier-Pilters and Dagg 1981, 35–39. Well-hydrated animals in an area abundant in edible plants graze from 8 to 12 hours per day.
- 152 Gauthier-Pilters and Dagg 1981, 35–39.
- 153 Gauthier-Pilters and Dagg 1981, 35–39. The type of feed determines the amount of fodder ingested, nutritious, yet dry perennials provide enough essential minerals and macronutrients in 5 kilograms of fodder in dry weight, whereas watery ephemerals have less dry matter and thus must be eaten in much larger quantities to make up for the difference.
- 154 Gauthier-Pilters and Dagg 1981, 35–39.
- 155 Gauthier-Pilters and Dagg 1981, 35–39.
- 156 Gauthier-Pilters and Dagg 1981, 35–39.
- 157 Schmidt-Nielsen 1964, 65.
- 158 Gauthier-Pilters and Dagg 1981, 35–39.
- 159 Gauthier-Pilters and Dagg 1981, 76; Schmidt-Nielsen *et al.* 1957. For instance, camels employ this protein-conservation mechanism when pregnant or growing. All ruminants can conserve protein in that way.

- 160 Schmidt-Nielsen *et al.* 1957.
161 Gauthier-Pilters and Dagg 1981, 42–44.
162 Gauthier-Pilters and Dagg 1981, 42–44. Saltbush contains much protein as well.
163 Gauthier-Pilters and Dagg 1981, 42–44.
164 Köpp 2013, 111.
165 Osborn and Osbornová 1998, 155.
166 Förster *et al.* 2010, 69.
167 Gauthier-Pilters and Dagg 1981, 50.
168 Gauthier-Pilters and Dagg 1981, 53.
169 Gauthier-Pilters and Dagg 1981, 54.
170 Gauthier-Pilters and Dagg 1981, 54–55.
171 Gauthier-Pilters and Dagg 1981, 54–55.
172 Gauthier-Pilters and Dagg 1981, 50.
173 Gauthier-Pilters and Dagg 1981, 50.
174 Gauthier-Pilters and Dagg 1981, 50.
175 Gauthier-Pilters and Dagg 1981, 52–53.
176 Gauthier-Pilters and Dagg 1981, 52–53.
177 Gauthier-Pilters and Dagg 1981, 52–53.
178 Gauthier-Pilters and Dagg 1981, 55–56.
179 Gauthier-Pilters and Dagg 1981, 55–56.
180 Gauthier-Pilters and Dagg 1981, 55–56.
181 Gauthier-Pilters and Dagg 1981, 55.
182 Schmidt-Nielsen *et al.* 1956.
183 Gauthier-Pilters and Dagg 1981, 55.
184 Gauthier-Pilters and Dagg 1981, 55.
185 Schmidt-Nielsen *et al.* 1956.
186 Gauthier-Pilters and Dagg 1981, 56.
187 Gauthier-Pilters and Dagg 1981, 56.
188 Gauthier-Pilters and Dagg 1981, 56–57.
189 Gauthier-Pilters and Dagg 1981, 56–57.
190 Gauthier-Pilters and Dagg 1981, 66–67.
191 Gauthier-Pilters and Dagg 1981, 110.
192 Gauthier-Pilters and Dagg 1981, 110.
193 Gauthier-Pilters and Dagg 1981, 110.
194 Gauthier-Pilters and Dagg 1981, 110.
195 Groom 1981, 159–160.
196 Gauthier-Pilters and Dagg 1981, 110.
197 Adams 2007, 80–81.
198 Adams 2007, 80–81.
199 Gauthier-Pilters and Dagg 1981, 101; Köpp 2013, 111.
200 Gauthier-Pilters and Dagg 1981, 101.
201 Gauthier-Pilters and Dagg 1981, 106.
202 Gauthier-Pilters and Dagg 1981, 106.
203 Gauthier-Pilters and Dagg 1981, 102.
204 Förster *et al.* 2010, 63
205 Adams 2007, 55–56
206 Förster, personal communication; Adams 2007, 55–56, 73.
207 Hamilton-Dyer 1998.
208 Köpp 2013, 111.
209 Förster, Reimer and Mahir 2013, 210.
210 Reimer and Förster 2013, 38–39

- 211 Förster *et al.* 2010, 64.
- 212 Förster *et al.* 2010, 64–66.
- 213 Förster *et al.* 2010, 64–66
- 214 Riemer and Förster 2013, 38–39.
- 215 Eichhorn *et al.* 2005, 216; Riemer and Förster 2013, 34.
- 216 Förster *et al.* 2010, 62.
- 217 Förster, personal communication.
- 218 Eichhorn *et al.* 2005, 222–223, 226.
- 219 Eichhorn *et al.* 2005, 222–223. The lack of such studies could possibly be explained with a following reasoning: where camel bones abound, it would be prohibitively expensive to analyse every single piece, especially if it is known that the site has been continuously used from the Roman to modern period and as such it contains both younger and older camel bones.
- 220 Hendrickx, Förster and Eyckerman 2013, 360–361.
- 221 Hendrickx, Förster and Eyckerman 2013, 360–361.
- 222 Hendrickx, Förster and Eyckerman 2013, 360–361.
- 223 Eichhorn *et al.* 2005, 222–223.
- 224 Eichhorn *et al.* 2005, 222–223.
- 225 Eichhorn *et al.* 2005, 222–223, 226.
- 226 Köpp 2013, 109–110.
- 227 Darnell 2002, 156.
- 228 Adams 2007, 62–63.
- 229 Brewer, Redford and Redford 1994, 82–85; Osborn and Osbornová 1998, 194–197; Boutantin 2013, 252. The taxonomical and genetic history of bovines remains gloriously convoluted. It is often difficult to securely ascribe fragmentary bone remains to a single species in Bovinae subfamily, with only minor osteological differences between the species (Uerpmann 1987, 71). Existence of several subspecies that readily interbreed and produce fertile hybrid offspring further complicates the matter. Due to contemporary developments in zoology, the whole bovid taxonomy was recently redrawn, with zebu and related taurine cattle now jointly classified as *Bos primigenius*, together with now-extinct aurochs. The author of this monograph believes that the new taxonomy, while more scientifically accurate, unfortunately adds to confusion by coalescing long-distinguished species into a larger whole; therefore, the author chose to follow the traditional bovine taxonomy for the sake of simplicity.
- 230 Brewer, Redford and Redford 1994, 82–85; Osborn and Osbornová 1998, 195.
- 231 Clutton-Brock 1993, 66.
- 232 Uerpmann 1987, 75, tab. 14a.
- 233 Uerpmann 1987, 74, tab. 14a.
- 234 Uerpmann 1987, 76, tab. 14b.
- 235 Edwards *et al.* 2010.
- 236 Mukasa-Mugerwa 1989.
- 237 Mason 1984, 12; Osborn and Osbornová 1998, 196.
- 238 Mukasa-Mugerwa 1989; Osborn and Osbornová 1998, 196, 197.
- 239 Mukasa-Mugerwa 1989.
- 240 Grigson 1991, 119–120.
- 241 Boutantin 2013, 252.
- 242 Riemer 2007, 106.
- 243 See Riemer 2007, 106–107 for a summary of the scholarly debate.
- 244 Riemer 2007, 106–107.
- 245 Gautier 2001, 628, fig. 23.2; Riemer 2007, 112.
- 246 McDonald 1998, *passim*, especially 136–137.
- 247 Uerpmann 1987, 76, tab. 14b.

- 248 Osborn and Osbornová 1998, 196.
- 249 Köpp 2013, 110.
- 250 Riemer 2007, 114
- 251 Köpp 2013, 110.
- 252 Köpp 2013, 114.
- 253 Köpp 2013, 110.
- 254 Riemer 2007, 114; Köpp 2013, 115.
- 255 Köpp 2013, 110.
- 256 Köpp 2013, 110.
- 257 Borchardt 1911, 163, no. 254, sheet 55; Köpp 2013, 110.
- 258 Couyat and Montet 1912, 38, no. 12, 19–21; Köpp 2013, 113.
- 259 Klaus and Röder 1962, 742; Klemm and Klemm 1990, 36; Adams 2007, 64.
- 260 Adams 2007, 64.
- 261 Epstein 1971, 427.
- 262 Epstein 1971, 522–525.
- 263 Epstein 1971, 450–451, 458–459. Native depictions of Dongolawi specimens were found in Nubia, Southern Upper Egypt and at Gebel Uweinat.
- 264 Epstein 1971, 438–439.
- 265 Epstein 1971, 453.
- 266 Epstein 1971, 454.
- 267 Epstein 1971, 459.
- 268 For a good recent survey of that topic, see Clutton-Brock and Raulwing 2009.
- 269 Clutton-Brock and Raulwing 2009, 41–42; Köpp 2013, 115. For Tell el-Dab'a and 'Esbet Helmi (Avaris) finds, see Boessneck and von den Driesch (1992); for Tell Hebua, Chaix (2002) and for Buhen, Clutton-Brock (1974), Clutton-Brock and Raulwing (2009).
- 270 Clutton-Brock 1974; Clutton-Brock and Raulwing 2009.
- 271 Chard 1937; Clutton-Brock 1974, 93ff; Clutton-Brock and Raulwing 2009, 41–42.
- 272 Epstein 1971, 430.
- 273 Epstein 1971, 430.
- 274 Breasted 1906, 270–271; Epstein 1971, 430.
- 275 Breasted 1906, 292; Epstein 1971, 430.
- 276 Epstein 1971, 428.
- 277 Epstein 1971, 435–436.
- 278 Epstein 1971, 430–431.
- 279 Köpp 2013, 116.
- 280 Schulman 1963, 83.
- 281 Darnell 2002, 132, 135, 138 ff; Köpp 2013, 115–116.
- 282 Adams 2007, 88. See also MacCoull 1977, 155–158.
- 283 Adams 2007, 58–59.
- 284 Davies 1989 (1969), 154–158; Adams 2007, 60.
- 285 Adams 2007, 58–60.

Roads of the Sinai Peninsula

4.1. Roman Sinai as the Nabataean trade corridor between Africa and Asia

Linking Asia to Africa, the triangular Sinai Peninsula flanks the eastern border of Egypt, its eastern and western coasts respectively outlined by twin Red Sea gulfs of Suez and Aqaba. Its northern (Levantine/Mediterranean) coast constitutes the central portion of the Fertile Crescent and the most direct thoroughfare between Egypt and Mesopotamia. Although it was not officially part of Roman Egypt, Sinai was crucial to Egypt's desert trading networks due to ongoing activities of the Nabataeans. Intrepid traders, desert explorers and prospectors, the Nabataeans formed a loose confederation of northern Arabian and southern Levantine tribes which, initially nomadic, began to settle down from the 4th century BCE onwards, founding a string of settlements (Petra, Elusa, Nessana, Oboda, Sobata, Mampsis) across southernmost Israel and Jordan.¹ In the Hellenistic–Early Roman period (3rd century BCE–1st century CE), the Nabataeans made increasingly larger profits from the roaring incense trade, plying aromatics across the northeastern Sinai Peninsula and the abutting Negev desert to the Mediterranean and the Red Sea ports.² Their intricate network of major and minor trails across the modern Israeli–Egyptian border tied their capital, Petra, to their other major settlements (Elusa, Oboda, Nessana), Gaza (their important Mediterranean market), and, relevant to this book, to sites within Egypt proper. Wandering in the northern Sinai and the Eastern Desert of Egypt, the Nabataeans left traces of their presence at the Red Sea coasts and in the Egyptian interior.³ Rome's fierce competitor in the aromatics trade, Nabataea was eventually incorporated into the Empire in 106 CE as Arabia Petraea province. Even though imperial agents took over the incense trade, the Nabataeans retained some of their former independence, as Rome had a rather tenuous grasp on Sinai deserts.⁴ Conquered relatively late compared

to Egypt, Sinai experienced a longer Hellenistic-Nabataean period (332 BCE–106 CE), preceded by Persian (539–332 BCE) era, and followed by Roman (106–324 CE), and Byzantine (324–640 CE) epochs. Often shadowing the ‘official’ network of Roman roads, Nabataean trails bound eastern Egypt to Near Eastern lands; recognising their importance, I included Sinai into the scope of this book. Within this chapter, I discuss both ‘Roman’ and ‘Nabataean’ desert trails, with particular attention given to those that connected Nabataean settlements in the central Negev to Romanera occupied sites in the Sinai and beyond.

4.1.1. Population density in the Sinai: inhabited and empty areas

Regarding the population zones and attractant nodes, their density in the Sinai remains uneven. The windswept northern coast has little potable water but attracts settlers as a politically and commercially important transition zone, whereas the remote interior of the peninsula receives more rainfall but remains sparsely inhabited. This basic population distribution pattern had emerged in the Graeco-Roman era, with three major zones of permanent human habitation found at the edges of the Peninsula and a fourth smaller one in the centre. The first zone, the section of the Mediterranean coast between Pelusium and Gaza, hosted a string of settlements and towns, such as Casium, Gerra, and Rhinocolura, many of them founded in the Graeco-Roman period to accommodate growing road traffic between Egypt and Palestine. The second habitation zone stretched along the strategically significant Isthmus of Suez, with the Red Sea port region under modern Suez already settled in the discussed period. The third habitation zone extended in a broad arc across the Negev upland and along Wadi Araba, the broad and arid valley between the southern shore of the Dead Sea and the tip of the Gulf of Aqaba. Apart from three peripheral habitation zones, the mountainous interior of the southern Sinai also accommodated a small population, part local nomadic tribes and part surveyors and prospectors from neighbouring lands. The southern Sinai in the Late Roman period saw the coming of anchoritic Christian monks, who settled in the mountainous interior in search of solitude; many could not find it, since Mount Sinai became a pilgrim magnet and drew in flocks of devout travellers willing to see famous sites of the Old Testament.

4.1.2. Geographical conditions for travel in the Sinai: geology and hydrology

A geologically diverse region, the Sinai Peninsula encompasses sand (*erg*), gravel (*serir*), and rock (*hamada*) desert. In the following section, I follow Ned Greenwood’s classification and distinguish six major regions in Sinai’s geomorphology, discussing demands they impose upon travellers. At the northern coast, a broad crescent of sands (Greenwood’s *Dune Sheet of the Mediterranean Littoral*) rises from the Suez Canal and curves north-eastward across the coastal plain as far as Beersheba in Israel.⁵ The region between the Delta and the city of Raphia, once known in Arabic as Gifar (Djifar),⁶ abounds in shifting sands of the *erg* type.⁷ Its most distinctive landform and greatest body of water is the brackish lake Bardawil, separated from the Mediterranean by a narrow, broken sandspit.

Travellers in the Gifar region often have difficulties finding their way and obtaining water. The area topography changed much between the Antiquity and the modern day. The ongoing desertification depopulated the once densely inhabited region,⁸ whereas winds, currents, and meandering Nile channels promoted the sedimentation processes in the Delta and in the Gulf and silting up ports such as Pelusium.⁹ Accordingly, to search for remains of ancient roads in that region often proves to be difficult at best, with trajectories of many ancient roads on our maps nothing more but approximations. Another problem is scarcity of potable water. Some intermittently flowing wadis, such as Wadi al-Arish, possibly could serve as water sources during the rainy season but remain dry throughout most of the year.¹⁰ Notably, the low-lying coastal plains suffers from groundwater salinity: a shallow layer of freshwater in the ground floats upon a denser layer of seawater that seeps inland from the sea. As a result, wells and waterholes often run brackish if overused. If freshwater is pumped faster than the natural aquifer replenishment rate, saltwater below penetrates upwards and contaminates the entire supply. The unique hydrology of the Dune Sheet, however, led to emergence of shallow lens of fresh groundwater (*themila*) masked by a layer of sand.¹¹ Imperceptibly damper places appear in satellite images as copses of palms or *sidri* trees, nestled in sandy hollows between the dunes, and can be tapped into by discerning travellers.

Wadi al-Arish, emptying into the Mediterranean at the coastal plain near modern al-Arish, originates in the central part of the Sinai, dominated by the desolate, undulating *al-Tih Plateau*, which rises from the coastal plain and extends southwards until it meets the crystalline mountain ranges of southern Sinai.¹² It is preceded by the slightly lower *Insular Massifs* of Gebel Maghara, Gebel Yelleg, and Gebel Hallal,¹³ the sandy hollow between them (Wadi Maghara) constituting a natural secondary traffic corridor between Egypt and the Palestinian interior. Tih, 'the Desert of Wandering', has little plant life and water. A monotonous, sun-baked plain of dark gravel, it rises steadily to the south until it falls sharply into the system of valleys that divides it from the mountainous Sinai Massif.¹⁴ Eastern slopes of al-Tih descend gently onto the Suez Foreshore,¹⁵ a sandy coastal plain between Suez and Wadi Gharandal that resembles the northern coastal plain and has similar problems with potable water supply. In the rugged, broken *Dividing Valleys* south of al-Tih, the Egyptian prospecting enterprise once founded a series of mines and smelters concentrated around Serabit al-Khadim and Plain of Markha.¹⁶ Further to the south rises the rugged *Sinai Massif*, a great maze of winding wadis and sprawling mountains that attracts much traffic in the region,¹⁷ partly due to its symbolic significance and partly due to its hydrological situation. In contrast to arid al-Tih or sand-choked Suez Foreshore and coastal Dune Sheet, water is easier to come by in the crystalline mountain plateaus and gullies of the southern Sinai. Mountain wells in the wadi beds draw water from well-filtered and fresh groundwater; moreover, intermittently flowing highland wadis tend to accumulate moisture under their beds, providing resourceful travellers and their animals with adequate amounts of liquids.¹⁸

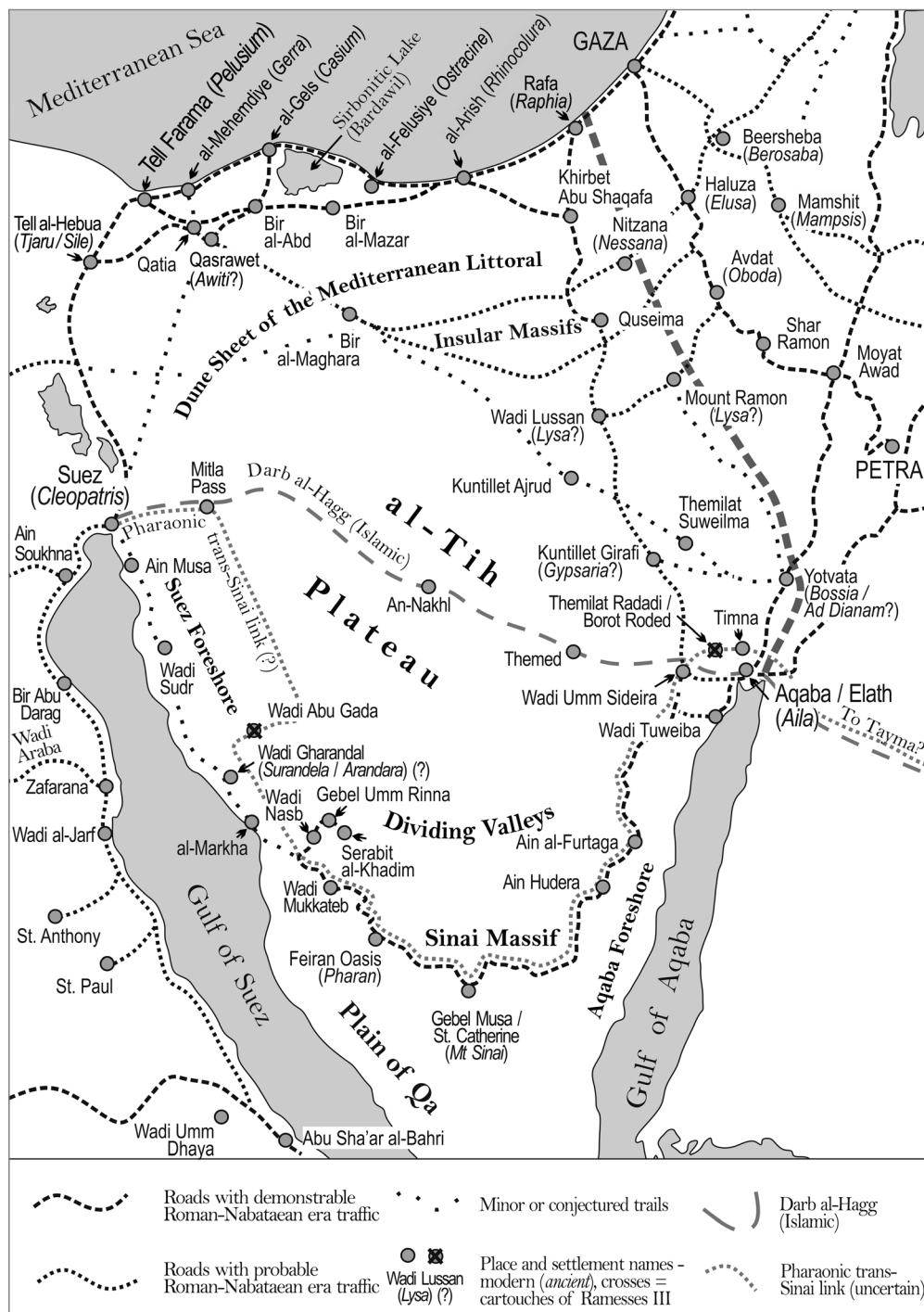


Fig. 4.1 Map 2 - Geography and road networks of the Sinai Peninsula

Map 2 – Sinai

Due to geographical and social factors, Sinai's two main road systems respectively traversed northern and southern regions of the peninsula, foreboding al-Tih Plateau in the middle discouraging all but the most dedicated caravans. In Northern Sinai, desert travellers preferentially crossed the quadrilateral area limited by settlements of Tell al-Farama (*Pelusium*), Gaza, Petra, and Aqaba (*Aila*), the shortest and the best land bridge between Egypt and Palestine. From the Eastern Delta port of Pelusium, trails headed for Palestinian cities of Rafa (*Raphia*) and Gaza around the marshy lake Sirbonis, with the older 'WAY OF HORUS'/MEDITERRANEAN COASTAL ROAD (section 4.2.1) skirting its southern shore (Qatia → Bir al-Abd → Bir al-Mazar → al-Arish → Rafa → Gaza) and the newer SIRBONITIC ROAD (section 4.2.2), its northern one (Gerra → Casium → Ostracine → Rhinocolura).

Complementing the Roman-controlled 'Way of Horus'/Sirbonitic Road, another network of trails, plied by the Nabataeans, traversed the Sinai hinterland and led to sites in Palestine and on the Red Sea coasts. Some of these weakly-attested trails linked Pelusium, Gerrha (modern al-Mehemdiye), and Casium (modern al-Gels) to the Suez Gulf settlement of Cleopatris (near modern Suez) (section 4.4). Southwest of Pelusium, one finds the Nabataean desert settlement of Qasrawet (Nabataean *Awiti?*), from which a desert track led to a remote spring of Bir al-Maghara and possibly onwards (section 4.3.3), either directly southeast to Arabia (→ Kuntillet Ajrud → Themilat Suweilma → Yotvata → Arabian Peninsula), east to → Quseima, or east-north-east (→ Nitzana → Haluza). The poorly attested WAY OF SHUR (section 4.2.3) might have formerly linked Pharaonic Egypt to the Negev via Wadi Maghara. In the Roman era, its role had probably been taken over by shorter Nabataean trails radiating from Bir al-Maghara.

Two major Nabataean thoroughfares in the Eastern Sinai region were GAZA-AILA ROAD (section 4.3.4) and GAZA-PETRA ROAD (section 4.3.1). An important connection between the Gulf of Aqaba and the Mediterranean, the so-called Darb al-Ghazza (Gaza Road) linked the port of Aila (the Red Sea/Gulf of Aqaba) to harbours at Gaza, Raphia, and Rhinocolura, paralleling the Gaza-Petra road and the modern Egypt-Israel border. Darb al-Ghazza's northern section (Rafa/al-Arish → Khirbet Abu Shaqafa → Quseima) was certainly active in the Nabataean and Roman periods; its southern section (Quseima → Wadi Lussan → Kuntillet Girafi) requires further surveys. In turn, the so-called Incense Road (Gaza → Haluza → Avdat → Shar Ramon → Moyet Awad → Petra) was plied by caravans that brought loads of Arabian aromatics to be delivered into the Roman Empire. Many trails snaked off the Gaza-Petra artery, some of them to the southwest, towards the limits of Egypt and into the area of this study.

Desolate al-Tih plateau cleaves Sinai in two parts: to my best knowledge, the first road ever to cross this gravelly plain was the Islamic pilgrimage route, DARB AL-HAGG. To the south of al-Tih, a weakly-attested Middle Kingdom trail (PHARAONIC TRANS-SINAI LINK, section 4.5.1) may have linked Egypt to the mines of Serabit al-Khadim and the Aqaba Gulf. Its southern section would eventually become a Nabataean track, with mining expeditions travelling from Petra (→ Aqaba → Ain Hudra → Gebel Musa → Pharan) towards the copper and turquoise lodes of Gebel Umm Rinna (section 4.5.2). Only in the Late Roman period was this trail extended westwards (Wadi Gharandal → Wadi Sudr → Suez) in order to link Egypt with sacred Christian sites around Pharan and Mt. Sinai.

4.1.3. Road systems of the Sinai Peninsula

In this work, I distinguish between two main road systems, respectively traversing northern and southern regions of the Sinai Peninsula. In the Northern Sinai, the Eastern Delta port of Pelusium (Tell al-Farama) constituted the major node in the coastal road network, with trails linking it to Palestine, the Gulf of Suez, and the Negev Desert. East of Pelusium, trails headed for Palestinian cities of Raphia and Gaza had to circumvent the marshy lake Sirbonis, with the older ‘Way of Horus’ / the Mediterranean coastal road (4.2.1) skirting its southern shore and the newer Sirbonitic road (4.2.2), its northern one. The Sirbonitic road at the coast went by Gerra, Casium, and Ostracine, to rejoin the ‘Way of Horus’ near Rhinocolura. The coastal network was supplemented by Nabataean trails in the desert hinterland to the south of the coast. Some of them linked Pelusium, Gerra, and Casium to the Suez Gulf settlements of Cleopatris and Clysma (section 4.4). The northern and southern road systems in the Sinai are separated by the expanse of al-Tih plateau. To its south, two weakly attested Pharaonic roads (the Cartouche Road of Ramesses III and the Pharaonic trans-Sinai link) may have skirted the southern edge of al-Tih, linking Clysma/Cleopatris (at the tip of the Suez Gulf) to Aila (at the tip of the Aqaba Gulf). Even further south, a more convenient but longer Nabataean track also connected these termini via a detour through Southern Sinai, making use of winding wadis more abundant in water sources.

4.2. Roads linking northern Egypt to Palestine

4.2.1. The ‘Way of Horus’/the Mediterranean coastal road (Maps 3, 4, 5, 6)

Situated in the central part of the Fertile Crescent, the Levantine coastal plain served since times immemorial as a corridor for the main track linking Egypt to Palestine. Originating in the eastern part of the Nile Delta, this trunk road shadowed the Mediterranean coast, traversing undulating dunes south of the barrier lake Sirbonis (modern Lake Bardawil);¹⁹ further east, it went past towns of Rhinocolura and Raphia to reach Gaza and strike further north to Syria. Named by the Bible as *the Way of the Land of Philistines* (Exod 13:17),²⁰ the road is best – yet erroneously – known today by an Egyptian toponym, *the Way of Horus*.²¹ A study by Dominique Valbelle suggests the coastal road between Egypt and Palestine may have had no Egyptian name, with the *Way of Horus* toponym denoting solely the area where it originated, the marshes around Egyptian fortress of Tjaru (Latin *Sile*, modern Tell al-Hebua).²² Due to inertia, the scholarly literature continues to metonymically extend the *Way of Horus* toponym to apply to the entirety of the coastal track between Egypt and Palestine. In this book, I will employ two toponyms (*Way of Horus* / *Mediterranean coastal road*) interchangeably, with the former set in quotation marks to signify its inherent imprecision.

Available references confirm this trunk road saw regular traffic in the Pharaonic, Hellenistic, Roman, and Arabic eras. The earliest Egyptian references to the Egypt-Palestine road are dated to the 5th dynasty (2500–2350 BCE), when an ‘overseer of the Ways of Horus’ is referenced in the contemporary royal titulature.²³ Similar titles appear

in the texts dated to the 18th dynasty, pointing to the renewed Egyptian interest in that track in the New Kingdom period.²⁴ A heavily fortified road, its initial portion was depicted on Seti I's war reliefs in Amun's temple in Karnak, with at least nine Egyptian fortresses recorded on this road between Sile and Gaza.²⁵ Alan Gardiner attempted to identify the fortresses mentioned on Seti's reliefs with archaeological sites, but many of his identifications turned out to be incorrect due to lack of archaeological data from the region available in his day.²⁶ During the Israeli occupation of the Sinai, Eliezer Oren conducted a series of surveys in the discussed region, the results of which regrettably have not been published in their entirety; nonetheless, what little has been published of Oren's data indicates the coastal land strip between modern cities of Qantara and Raphia used to host a sizeable population in the Pharaonic period, with hundreds of Early, Middle, and Late Bronze Age sites peppering the putative run of the road.²⁷

Heavily garrisoned in the Old and New Kingdom periods, the road between Pelusium and Gaza briefly lost some of its importance in the Late period. Herodotus' account states, on the eve of the Persian conquest of Egypt, the coastal road was largely left to local nomadic Arabian tribes to roam as they pleased, with Egyptian forces under Psammenitus safely sequestered in Pelusium at the western terminus of the road. Entering Sinai, Cambyses obtained the right of passage from the Arab chieftain of the land and crossed the coastal plain with relatively little difficulty, with water supplies provided by his Arab allies.²⁸ In contrast to the Egyptians of the Late Period, the conquering Persians saw the importance of this link between Egypt and Asia, and they made sure the native tribesmen kept the road-stations along the coast well-supplied with water,²⁹ with new defensive works at the roadside staffed with Persian troops.³⁰ This brief period of increased activity along the road ended with the Persian occupation of Egypt. In the Graeco-Roman period, many minor and major settlements appeared along the northern coast of Sinai;³¹ however, surviving itineraries suggest travellers between Egypt and Palestine during the period in question preferred to follow the so-called Sirbonitic road and skirt Lake Bardawil from the north, with the western section of the road (from Pelusium to Rhinocolura) seeing only limited traffic.

THE RUN OF THE ROAD

The eastern terminus of the trunk road shifted between the Pharaonic and Graeco-Roman period, reflecting changes in the Nile bed, coastline, and settlement patterns. Under the pharaohs, the 'Way of Horus' originated near the Egyptian fortress of Tjaru (Latin *Sile*, modern Tell al-Hebua).³² A *hṯm*-fort (a post erected to control people's movements on the borders),³³ Tjaru was linked to the Nile by means of a canal that facilitated transport of goods and people from the Nile to the road. Tjaru flourished until the Persian period, gradually becoming overshadowed by another settlement 25 kilometres to the north, Pelusium (modern Tell al-Farama).³⁴ Eventually, the growing importance of Pelusium necessitated building a different branch of the road to accommodate the eastward-bound traffic from this city. The older and newer

branches of the road converged near the oasis-village of Qatia (discussed in detail in section 4.3.3).

In the Graeco-Roman period, the branch of the road originating in Pelusium radiated southeast from the city and cut through the sandy plain at the western edge of the Lake Sirbonis. On its way, it passed by Rumani, an ancient palm copse where excavators uncovered remains from the New Kingdom, Persian, Hellenistic, and Roman periods.³⁵ In contrast, the branch striking from Sile turned east-north-east and skirted the edge of an expansive dune sheet to the south. Along its run, one travelled near the brackish well of Bir al-Nuss and ancient, poorly identified sites of Gebel Lissan and al-Ghurabi, which yielded assemblages of Roman potsherds.³⁶ Branches from Pelusium and Sile met in the oasis of Qatia.³⁷ Further on, the trunk road veered gently northeast and then east-north-east; meandering between marshy bogs of future Lake Bardawil to the north and rolling dunes to the south, the road went past many palm groves that remain in the area to this day.³⁸

The first stop on this stretch of the road was the salty well of Bir al-Abd. Surveys in the area uncovered a New Kingdom fortress and some pottery shards dated to the Graeco-Roman period, indicating the well could have been a Roman road station.³⁹ Another waterhole further east on the road, Bir al-Mazar, shows even more discernible traces of Roman presence. Pottery assemblages gathered at the site reveal two distinct occupational phases – an Early Roman settlement with the Nabataean presence (1st–2nd century CE) and a smaller Late Roman site somewhat to the east (4th century CE);⁴⁰ even when unoccupied, Bir al-Mazar apparently stood for an important water stop on the southern shore of Bardawil.

Past Bir al-Mazar, the inland road paralleled the Sirbonitic coastal road (section 4.2.2), cutting through perilous quicksand known for having hindered the progress of Artaxerxes III (342 BCE) and Antigonos I Monophthalmus' armies (306 BCE);⁴¹ the coastal and inland tracks ultimately converged in the vicinity of the next road station, al-Arish – once the ancient city of Rhinocolura, occupied at least since the late 4th century BCE and known from Greek, Latin, and Coptic texts.⁴² Rhinocolura lay on a sandy, extremely arid and inhospitable plain, abutting the western bank of Wadi al-Arish as it empties into the Mediterranean.⁴³ A noteworthy commercial community, the city apparently had direct trade links with (post-)Nabataean communities in the Negev and beyond (see section 4.3.2).⁴⁴ If Strabo is to be believed, Nabataean caravans once bore loads of aromatics from the Red Sea port of Leuke Kome through Petra and the Negev desert to Rhinocolura, to be delivered to Egypt, Syria, and overseas. In Strabo's time (early 1st century CE), nonetheless, the traffic from Negev to Rhinocolura apparently thinned, as the newly founded Roman Red Sea port of Myos Hormos siphoned off trade once bound for Leuke Kome and Petra;⁴⁵ even so, Nabataean remains at Bir al-Mazar imply these desert traders continued to visit the coastal communities along the trunk road until at least the 2nd century CE.

Moving northwest past Wadi al-Arish towards Rafa, a traveller on the trunk road encounters another cluster of enigmatic ancient sites near the modern village of

Sheikh Zuweid. One of them, known as Tell Temilat or Tell Abu Selima, revealed occupation layers ranging from 1350 BCE to the Early Roman period. Following Félix-Marie Abel, Herbert Verreth suggests Tell Temilat, abandoned at the brink of the Roman era, could have been the ancient and long-lost city of Ienysos, its name mentioned only in Herodotus' account of Cambyses' invasion of Egypt; however, Verreth qualifies Abel's identification due to lack of corroborative evidence.⁴⁶ Several hundred metres to the north of Tell Temilat, one finds the site of Tell al-Eqneiyin/Tell Jenein, where Israeli surveys uncovered pottery dating to periods from Ptolemaic to Arab;⁴⁷ a subset of scholars equates the tell with the Roman road station Boutaphios, attested only once in 322–323 in travel documents of an official named Theophanes (the so-called Theophanes' archive), but consensus has not been reached on that matter.⁴⁸ Finally, north of Tell al-Eqneiyin lies a coastal site called Tell al-Sheikh; yielding Hellenistic, Roman, and Arab materials, the tell is commonly identified with the Roman toponym of Bytl (attested in 217 BCE), also known as Bitylion (attested in the 4th–7th centuries CE).⁴⁹ After leaving the area of Sheikh Zuweid, the road continued northeast to Raphia (modern Rafa), an ancient city of great military importance. Mentioned in Egyptian and Assyrian sources, it was chiefly known as the site of numerous battles, such as one fought in 217 BCE between the victorious Ptolemy IV and Antiochus III.⁵⁰ The road then continued onwards to Syria, passing into Palestine proper and beyond the limits of this survey. The remainder of road stations between Rhinocolura and Raphia not mentioned here are either very tentatively identified or unidentified.⁵¹ Currently, the area awaits further excavations; one can hope that the long-awaited publication of Oren's materials will shed more light on the enigmatic coastal Bronze Age settlements along the Egypt–Palestine coastal road.

4.2.2. *The Sirbonitic road (Maps 3, 4, 5, 6)*

HISTORY

At an unknown (and oft-disputed) point in the Early Roman period, travellers between Egypt and Palestine apparently started to prefer the so-called Sirbonitic road, an alternative branch of the 'Way of Horus' that struck east from Pelusium, swerved towards the coast, passed through Gerra and Casium, ran through the entire length of the narrow sandbar, separating the Lake Sirbonis from the Mediterranean Sea, and re-joined the trunk road near Rhinocolura.⁵² Who exactly first walked this narrow passage remains disputed, with some scholars arguing for a 4th century BCE date. Notably, Pau Figueras conjectured that Alexander the Great opened the coastal road during his passage to Pelusium, his purported objectives being to avoid Persian forces guarding the 'Way of Horus' and to have his fleet shadow and supply the troops along the coast.⁵³ Herbert Verreth doubted Figueras' theory, pointing out that the road was not fit for an army. At the narrowest, the sandbar spans only a couple metres. The marching troops, stretched into a very long column, would have no place to overnight.⁵⁴

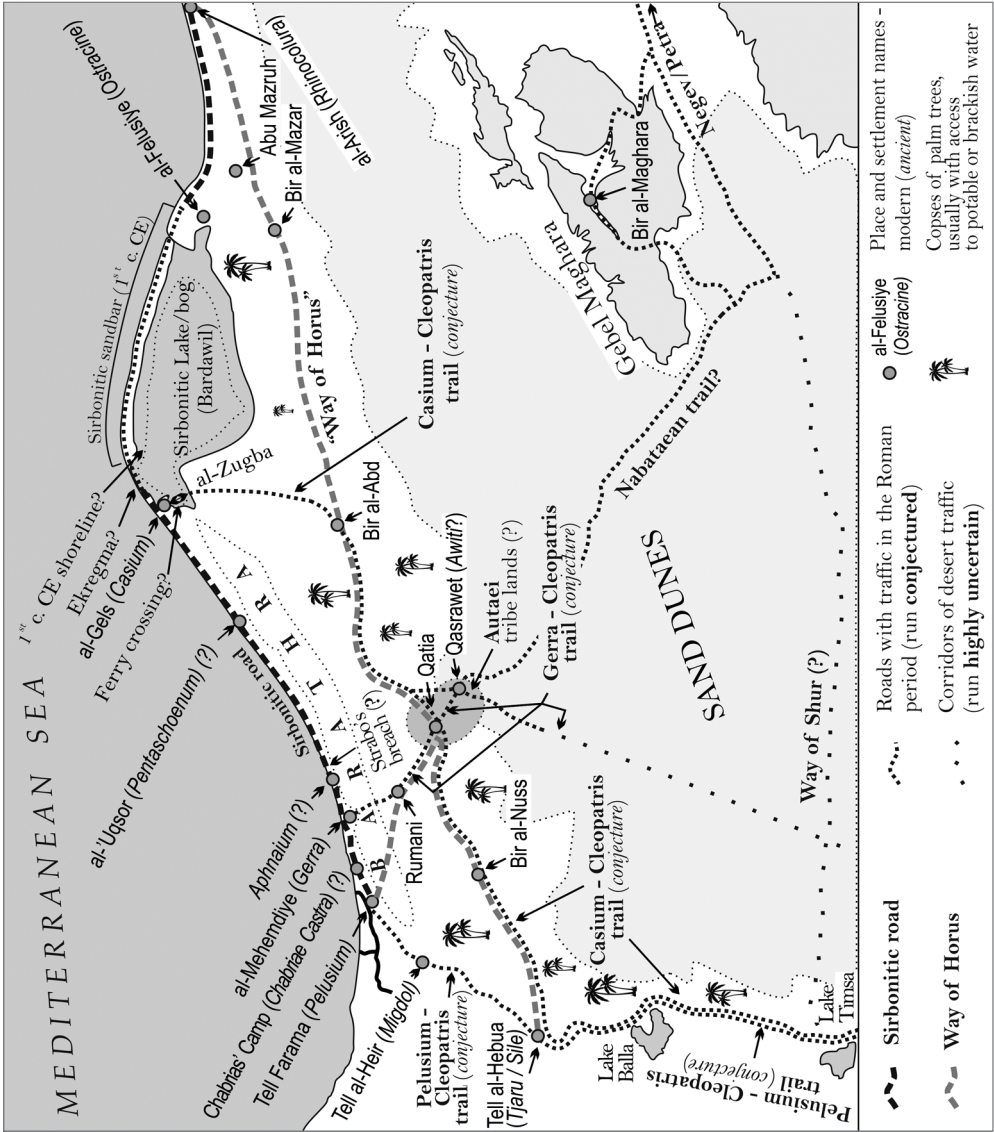


Fig. 4.2 - Map 3 - Desert roads in Pelusium-Cleopatra region

Maps 3 and 4 – Pelusiac Junction

In the Pelusiac region, rapidly shifting sands and changing coastlines have obliterated much of the former road infrastructure: what remains is often difficult to date to a specific period. From the Eastern Delta port of Pelusium, trails headed for Palestinian cities of Rapha and Gaza around the marshy lake Sirbonis (modern Bardawil), with the older 'WAY OF HORUS' / MEDITERRANEAN COASTAL ROAD skirting its southern shore and the newer SIRBONITIC ROAD, its northern one. In the Roman era, the Sirbonitic lagoon eventually became a salty bog, but it was still prone to occasional catastrophic flooding due to local tectonic movements. Other travel obstacles in the region included Barathra (the Pits) of Pelusium, a boggy trough purported to lie somewhere between Casium and Pelusium, and the Dune Sheet of the Mediterranean Littoral, a waterless crescent of sands rising from the Suez Canal and curving north-eastward across the coastal plain as far as Beersheba in Israel. Pliny mentions three trails linking the Mediterranean settlements of Pelusium, Gerra, and Casium to the Gulf of Suez that must have navigated the Dune Sheet. Whether they went across it or skirted the edges still remains unknown. Southwest of Pelusium, one finds a twin desert settlement of Qatia and Qasrawet, from which Nabataean desert tracks might have led to a remote spring, Bir al-Maghara, and onwards to the Negev. The often-shifting run of the Red Sea-Nile canal was mapped according to Cooper's estimates (2009, 196, fig. 20.2).

Maps and materials consulted: Figueras 1988, 65; 2000, 8, fig. 1, 16, fig. 3, 18–20; Barrington Atlas (ed. Talbert 2000), map 70, 74; Verreth 2006, 10; Cooper 2009, 196, fig. 20.2.

'WAY OF HORUS' / MEDITERRANEAN COASTAL ROAD (section 4.2.1):

- [Southern branch – Pharaonic] Tell al-Hebua (*Tjaru/Sile*) → Bir al-Nuss → Qatia → [branches converge]
- [Northern branch – Persian/Graeco-Roman] Tell al-Farama (*Pelusium*) → Rumani → Qatia → [branches converge]

Qatia → Bir al-Abd → Bir al-Mazar → al-Arish (*Rhinocolura*) → [northeast to Gaza and Palestine]

SIRBONITIC ROAD (section 4.2.2): Tell al-Farama (*Pelusium*) → Chabrias' Camps (*Chabriae Castra*) (unidentified) → al-Mehemdiye (*Gerra*) → al-'Uqsor (*Pentashoenum?*) → al-Gels (*Casium*) → Ekregma → Sirbonitic sandbar → al-Felusiye (*Ostracine*) → al-Arish (*Rhinocolura*) → [joins the 'Way of Horus']

PELUSIUM–CLEOPATRIS TRAIL (section 4.4.1): Tell al-Farama (*Pelusium*) → Tell al-Heir (*Migdol*) → Tell al-Hebua (*Tjaru/Sile*) → Lake Balla → Lake Timsa → [southwards to Cleopatris]

CASIUM–CLEOPATRIS TRAIL (section 4.4.2): al-Gels (*Casium*) → [ferry crossing?] → al-Zugba promontory → Bir al-Abd → Qatia → Bir al-Nuss → Tell al-Hebua (*Tjaru/Sile*) → [joins Pelusium–Cleopatris trail]

GERRA–CLEOPATRIS TRAIL (section 4.4.3): al-Mehemdiye (*Gerra*) → Rumani → Qatia → Qasrawet (*Awiti?*) → [south-west-south across the Dune Sheet?] → [joins the Casium–Cleopatris trail]

QATIA–QASRAWET–BIR MAGHARA–(NEGEV?) TRAIL (section 4.3.3): Qatia → Qasrawet (*Awiti?*) → Bir al-Maghara → [possible extension to Elusa, Nessana, or Arabia]

Travelling along the Sirbonitic sandbar posed special problems.⁵⁵ A narrow, windswept strip of land about 80 kilometres long,⁵⁶ it has no vegetation or sweet water sources. In the time of Ptolemies, those marching along the sandbar could not keep their feet dry. The steadily accruing sandspit did not form a continuous bar, with a treacherous breach east of Casium known as Ekregma (ἐκρηγμα, *breaking forth of a stream* in Greek).⁵⁷ The breach must have been characteristic enough to deserve a mention by Plutarch, who records Gabinus, Ptolemy, and Anthony having to navigate the inhospitable sandspit and cross the Ekregma in their marches to Pelusium.⁵⁸ Sometime before Strabo's day, sand had slowly filled the Ekregma. Without seawater inflow, the Sirbonitic lagoon eventually became a salty bog,⁵⁹ but it was still prone to occasional catastrophic flooding due to local tectonic movements.⁶⁰ Other dangers in the region included Barathra (βάραθρα, *pits/hollows* in Greek), a region of marshes and quicksand to the west and south of the lake, impeding movements of invading armies; mentioned in Hellenistic sources (4th–1st century BCE),⁶¹ Barathra subsequently disappear from our records, which led Herbert Verreth to believe, by the Roman period, they mostly dried up as the lake shrunk into a minor bog.⁶² The region of the erstwhile lake became an arid sand field in the Late Antiquity. It remained so until the end of the Byzantine period, when a series of earthquakes gradually eroded the Sirbonitic sandspit and reflooded the lake bed, making the coastal road largely impassable.⁶³

THE RUN OF THE ROAD

The Sirbonitic road began in Pelusium (modern Tell al-Farama) and struck east-north-east along the coast, skirting the northern edge of so-called Barathra of Pelusium, a marshy and hollow depression periodically inundated by rising waters of the Pelusiatic branch of the Nile.⁶⁴ In its run east, the road passed through Chabrias' Camps (Chabriae Castra), an as-yet-unidentified military settlement protecting Egypt's eastern flank; established in early 4th century BCE, it was known to both Strabo and Pliny but not to later authors.⁶⁵ Further east lay Gerra (modern al-Mehemdiye), an army camp and important road station at the edge of Pelusiatic marshes.⁶⁶ Founded in the 3rd century BCE, it flourished well into the Byzantine period, not only as a stop on Sirbonitic road, but also as a terminus for one of the trails that linked the Mediterranean coast to the Gulf of Suez (see section 4.4.3). Today, the former site of Gerra adjoins the western tail end of Lake Bardawil and its sandspit; it was not so in the Early Roman period, when the Barathra of Pelusium most likely extended over the western part of the lake bed as far east as Casium, and the markedly smaller Sirbonitic Lake filled the triangular basin between Casium and Ostracine.⁶⁷

Following the coast east of Gerra, the Sirbonitic road passed through two late-founded and poorly identified towns. First came the as-yet-unidentified community of Aphnaium, appearing at the beginning of the 5th century CE in the ecclesiastic sources as a bishopric. Very few details are available about the town and its surroundings.⁶⁸ Unlike Aphnaium, the following road station of Pentaschoenum appears in many

documents and itineraries describing this region. A relatively late foundation of ca. 300 CE,⁶⁹ Pentaschoenum was preliminarily excavated and is tentatively identified with the modern al-'Uqsor, but much of the material gathered at the site still awaits publication.⁷⁰

The largest settlement on this stretch of the road was undoubtedly Casium (modern al-Gels), a town situated at the foothills of eponymous Mount Casius, a sandy hillock about 100 metres high.⁷¹ Visited by traders at least from the 6th century BCE but permanently settled in the Late Ptolemaic period,⁷² the neighbourhood of Casium boasted the renowned temple of Zeus Kasios and the tomb of Pompeius Magnus, also famous for its thriving textile, boatbuilding, rope- and knotwork industries.⁷³ In the Early Roman period, Mount Casium stood as a natural boundary between swamps of Pelusium to the west and shrinking Lake Sirbonis to the east; to the south lies al-Zugba ridge, along which once ran an ancient trail connecting Casium to sites further to the south (see section 4.4.2).⁷⁴ The hillock towering over Casium also marked the beginning of the Sirbonitic spit, which stretched eastwards between the lake and the Mediterranean for about 45 kilometres.

Leaving Casium, the Sirbonitic road proceeded east along the sandbar, soon reaching a distinctive breach known as Emersus (in Latin) or Ekregma [Ἐκρηγμα] (in Greek). A natural outlet through which Lake Sirbonis previously communicated with the sea, the Ekregma apparently turned into marshy shallows and, by Strabo's day, filled with earth, which might have contributed to dropping water levels in the lake.⁷⁵ Relevantly, when the Sirbonitic sandbar became traversable remains contested. Verreth hypothesised the sandbar was perennially prone to flooding, and travellers in the Ptolemaic period might have preferred to skirt the southern edge of the lake between Casium and Ostracine.⁷⁶ Nevertheless, a detour to Casium was hardly necessary when one travelled to Pelusium. The best course of action would be to avoid Casium and head for Pelusium along the former 'Way of Horus', via Qatia and Rumani. *Pace* Verreth, surviving Late Roman itineraries mention Gerra, Casium, and Ostracine, which seems to imply, although not prove, the Sirbonitic sandbar saw traffic at least in the Late Roman period (if not before), when the lake level dropped and the Ekregma filled up.

The final station on the Sirbonitic sandspit was Ostracine (Greek Ostrakine, modern al-Felusiye).⁷⁷ Attested in sources from late 1st century BCE to 7th century CE, Ostracine abutted the formerly swampy eastern bank of the Sirbonitic Lake.⁷⁸ As the lake shrank and the water table lowered, Ostracine of the Early Roman period became known for its proverbial aridity (inhabitants purportedly bringing water from elsewhere); curiously, its food vendors sold water-loving crops (such as grapes and cucumbers) in the 4th century CE, implying, by that time, the town found access to reliable sources of water.⁷⁹ According to Verreth's credible explanation for this incongruity, the Sirbonitic Lake was fed by both sea brine (on the north) and sweet water aquifers (on the south). When the Ekregma filled, the influx of brine into the lake diminished, the groundwater lost much of its salinity, and by the Late Roman period, the local

wells yielded water suitable for drinking and agriculture.⁸⁰ Today, the site remains poorly surveyed due to the renewed flooding of Lake Bardawil, but excavations at al-Felusiye yielded Roman and Byzantine remains, with traces of possible harbour also found to the north.⁸¹ Beyond Ostracine, the Sirbonitic road continued east, finally converging with the 'Way of Horus' in the vicinity of Rhinocolura, to continue on north- and eastwards (section 4.2.1).

ITINERARIES MENTIONING THE ROAD

As for the ancient itineraries describing the Sirbonitic road, the most complete one recording road-stations and distances between Rhinocolura and Pelusium is the so-called Theophanes' Archive (317/324 CE) (P.Ryl. 627–629), a personal log of a man who travelled both ways along the Sirbonitic road and jotted down the lengths between stops. Unfortunately, only the record of his Egypt–Palestine trip survived for this branch of the road.⁸²

Table 4.1 Stations on the Pelusium–Rhinocolura road according to Theophanes' Archive

Stations on the Pelusium–Rhinocolura road according to Theophanes' Archive	Distance in Roman miles
Pelusium–Gerra	10
Gerra–Pentaschoenum	12
Pentaschoenum–Casium	16
Casium–Ostracine	26
Ostracine–(<i>Ecregma</i>)–Rhinocolura	24
IN TOTAL	88

The *Antonine Itinerary* (2nd/3rd century CE?) records the track as travelled from Palestine to Egypt. Distances between the stations situated in the eastern part of the Sirbonitic sandbank tally with those given by Theophanes' Archive. Conversely, the western section distances stretch somewhat longer, and the text omits certain road-stations:⁸³

Table 4.2 Stations on the Rhinocolura–Pelusium road according to *Itinerarium Antonini*

Stations on the Rhinocolura–Pelusium road according to <i>Itinerarium Antonini</i> (original spelling)	Distance in Roman miles
Rhinocolura (Rhinocorura)–Ostracine (Ostracema)	24
Ostracine (Ostracema)–Casium (Cassio)	26
Casium (Cassio)–Pentaschoenum (Pentascino)	20 (16 in Theophanes' Archive)
Pentaschoenum (Pentascino)–Pelusium (Pelusio)	26 (22 in Theophanes' Archive)
IN TOTAL	96 (88 in Theophanes' Archive)

In the least precise *Peutinger Map* (4th century CE), the medieval copyist regrettably omitted some road stations and underestimated distances between them.⁸⁴

Table 4.3 Stations on the Rhinocolura–Pelusium road according to Tabula Peutingeriana

<i>Stations on the Rhinocolura–Pelusium road according to Tabula Peutingeriana (original spelling)</i>	<i>Distance in Roman miles</i>
Rhinocolura (Rhinocorura)–Ostracine (Ostracema)	23 (24 in Theoph. Arch.)
Ostracine (Ostracema)–Casium (Cassio)	-
Casium (Cassio)–Gerra	23 (28 in Theoph. Arch.)
Gerra–Pelusium (Pelusio)	8 (10 in Theoph. Arch.)
IN TOTAL	54+X (88 in Theoph. Arch.)

4.2.3. The Way of Shur (Maps 3 and 4)

According to Hoffmeier and Moshier, another ancient trail known as the Way of Shur (Genesis 16:7) paralleled the ‘Way of Horus’, forming an alternative connection between the eastern border of Egypt and Palestine.⁸⁵ Its run in Sinai remains unplotted, although Israeli surveyors tentatively identified the Way of Shur with an ancient trail striking south from Jerusalem to northeastern Sinai and then parts unknown.

THE RUN OF THE ROAD

In Egypt, the Way of Shur purportedly began in Wadi Tumilat (Tjeku), possibly to be identified with another toponym, ‘the land of the cistern of Ayn’.⁸⁶ A water-abundant fortified area at the border of Egypt, Wadi Tumilat was crossed by many minor trails striking towards Central Sinai. A large *htm*-type border fort at Tjeku, paired with its northerly sister fort at Tjaru/Sile, formed a symbolic entrance into the Egyptian domain and a propaganda statement to the roaming desert tribes; a string of such forts at Egypt’s eastern border facilitated controlling the nomadic movements near the borders.⁸⁷ Kitchen has conjectured this stretch of road – in analogy to the ‘Way of Horus’ – might have been secured with a line of fortlets built during the Ramesside period; Kitchen’s hypothesis has not yet been confirmed by ground checks.⁸⁸ Running west from Wadi Tumilat, the Way of Shur would then follow the modern road from Cairo to Jerusalem.⁸⁹ Striking eastwards from Lake Timsa, the trail would cut through the swath of dunes towards the remote rocky massif of Gebel Maghara, descend into Wadi Maghara, and finally feed into a nexus of Nabataean trails linking Pelusium, Qasrawet, and Rhinocolura to the Negev Desert, Petra, Palestine, and Arabia (see section 4.3).⁹⁰

In contrast to the understudied Egyptian section of the trail, its Israeli run has been extensively researched and tentatively mapped, surveys pointing to its continued use

in the Bronze and Iron ages. The relevant stretch of the Way of Shur most probably led southeast from Hebron past numerous ancient sites (Beersheba → Haluza → Rehovot → Beerotayim), onwards to the modern Israeli-Egyptian border and remote Sinai waterholes at Kadesh Barnea and Quseima.⁹¹ Its exact run might have shifted from age to age. In the Iron Age IIA period (1000–925 BCE), the trail followed a line of fortresses between Ruheiba/Rehovot and Beerotayim,⁹² whereas in Classical Antiquity, it might have veered off to the north, passing via Nessana and Quseima. Surveys of Tali Erickson-Gini uncovered a possible extension of the older track. A series of Early Bronze rectangular platforms draw a line between Beerotayim and Kadesh Barnea, with similar installations found around the Gebel Maghara massif.⁹³ Regrettably, the middle portion of its hypothetical run, traversing a barren dune sheet in central and western Sinai, has – to the best of my knowledge – not been surveyed and has yielded no ancient remains. What little we know about its run comes from hearsay and unconfirmed conjectures.

Whether the entirety of the Way of Shur saw traffic in Graeco-Roman Antiquity remains unknown. Scant archaeological evidence indicates that at least the trail's eastern (Israeli) and central (Sinai) sections were travelled in the Roman period. In the Hellenistic-Nabataean period (3rd century BCE–1st century CE), the central (northern Sinai) and eastern (central Negev) portions ran through lands controlled by the Nabataeans, with the central Negev region becoming a hive of the commercial activity due to the Nabataean incense trade (section 4.3.1).⁹⁴ Across the Negev uplands, an intricate network of major and minor trails straddled the modern Israeli-Egyptian border, tying local Nabataean settlements (Elusa, Oboda, Nessana) to Gaza and Petra (section 4.3.1), Wadi Araba (section 4.3.4), Rhinocolura (section 4.3.2), and Qasrawet and Qatia (section 4.3.3). On the grounds of convenience, a trail striking west from the Central Negev nexus towards Lake Timsa would complement other trading routes in the region, providing a direct, shorter connection from Negev to Egypt that bypassed the Roman coastal communities. Nabataean remains at Qasrawet and Qatia (section 4.3.3) imply the existence of a road connection between Gebel Maghara and the Negev. Whether this connection followed the ancient run of the Way of Shur remains uncertain.

However, the trail's central section might not have been easily traversable since it would have to cut through the swath of sand dunes between the coastal plain and the Isthmus of Suez. In the days of donkey caravans, travellers on the Way of Shur could have preferentially skirted the dunes from the north, crossing the dune sheet at its narrowest – either between Qasrawet and Bir al-Maghara or between Rhinocolura and Nessana (along Wadi al-Arish). After the introduction of camels, caravans probably directly negotiated the dune sheet, extending the span of Nabataean trail networks. I have argued below that the Plinian camel trail between Gerra and Cleopatris likely crossed the aforementioned dune sheet from north to south (section 4.4.3); by the same logic, it is possible (although still unproven) that another camel trail crossed the dunes from west to east, directly connecting Nabataean communities in the Negev

to Egypt. Nevertheless, the final verdict on the trail's activity in the Graeco-Roman period and beyond will have to wait until the dune sheet in the northern Sinai yields more evidence for the trail's run.

4.3. Nabataean road nexus in the Negev

Complementing the coastal 'Way of Horus'/Sirbonitic Road (sections 4.2.1 and 4.2.2), another network of desert trails traversed the Sinai hinterland and led to sites along the so-called Incense Road, a Petra–Gaza thoroughfare plied by the Nabataean caravans bringing loads of Arabian aromatics to be delivered into the Roman Empire.⁹⁵ The chief area of interest to this study is the central Negev section of the Incense Road. Since times immemorial, this arid upland stood for the crossroads between Sinai, Egypt, Palestine, and Transjordan; from the 3rd century BCE onwards, the central Negev saw an increase in caravan traffic, as the initially nomadic Nabataean tribes settled down at a series of settlements (Elusa, Nessana, Oboda, Sobata, Mampsis) along or close to the Petra–Gaza road.⁹⁶ Intrepid traders and explorers, the Nabataeans spread across Negev and crossed into the northern Sinai and the Eastern Desert, with traces of their presence uncovered at the coasts and in the Egyptian interior.⁹⁷ Accordingly, the following part of this work discusses roads that connected Nabataean settlements in the central Negev to Romanera occupied sites in the Sinai and beyond. I begin my analysis with a brief description of the Incense Road and major Nabataean sites flanking it (section 4.3.1) then proceed to discuss trails that linked sites at the Petra–Gaza road to communities in the Northern Sinai: Rhinocolura (section 4.3.2) and Qasrawet/Qatia (section 4.3.3). The following sections deal with other roads that passed through the Nabataean nexus in the central Negev and led to sites in the Sinai, such as the trails leading to Aila from Gaza (section 4.3.4) and Jerusalem (section 4.3.5).

4.3.1. The Incense Road (Petra–Gaza) (Maps 5 and 6)

The Mediterranean-facing section of the Incense Road, the Petra–Gaza trail was a trade corridor along which incense, spices, and perfumes harvested or purchased in Southern Arabia were brought into the Roman empire. Running west from Petra, the road ran northwest across the Arabah valley, ascended into the central Negev highlands, negotiated an elongated erosion cirque known as Makhtesh (Crater) Ramon and passed through the Nabataean communities of Oboda (modern Avdat) and Elusa (modern Haluza) on its way to Gaza. A well-surveyed and trodden desert thoroughfare, the Petra–Gaza road lies slightly beyond the limits of this survey and therefore is only of indirect consequence to this study. Nonetheless, such a well-trodden trade corridor exerted powerful attraction on caravan traffic on the region. Many trails snaked off the Incense Road artery, some of them to the southwest, towards the limits of Egypt and into the area of this study.

Whether the Petra–Gaza road saw the constant volume of traffic throughout the Hellenistic–Nabataean (332 BCE–106 CE) and Roman (106–324 CE) periods was a point of contention for many scholars.⁹⁸ In the 3rd and 2nd century BCE, Nabataean agents

first furnished the road with forts and caravanserais to accommodate the increasing aromatics trade between Arabia and the Mediterranean.⁹⁹ In the 1st century BCE, the northernmost section of the road (Gaza–Elusa) experienced a brief lull in activity. The Hasmonean king of Judea, Alexander Jannaeus, conquered Gaza in 99 BCE, closed the city's gates to his Nabataean rivals and, as a result, severely disrupted their trade routes.¹⁰⁰ For several following decades, the perfume traffic from Petra avoided the Hasmonean Gaza, possibly in favour of Rhinocolura, which Strabo described as one of the Nabataean incense trade termini (see section 4.3.2).¹⁰¹ Thanks to careful political manoeuvring, the Nabataeans regained control of the Gaza–Elusa road section sometime around 65 BCE. Afterwards, the traffic on the Incense Road thickened again, possibly in response to growing commercial pressure from Roman ports on the Red Sea's western shore.¹⁰² Towards the end of the 1st century BCE, the Nabataeans slightly rerouted the Incense Road's run in the Negev. Previously circumventing the hollow of Makhtesh Ramon from the east, the trail from that time onwards traversed the crater directly via a newly-hewn pass in its northwestern cliff.¹⁰³ Discounting brief decreases in activity, the trail remained well-trodden in the first two centuries CE despite the Roman conquest of Nabataea in 106 CE. Surveyors of roadside installations between Gaza and Petra have formerly drawn attention to what they perceived as a break (2nd–3rd century CE) between pre- and post-conquest occupation layers, linking it to the purported decline of Negev communities following the Roman incorporation of Nabataea and resultant slump in trade on the road.¹⁰⁴ Rudolph Cohen, having resurveyed roadside installations on the trail, found evidence neither for unambiguous post-106 CE occupation break nor for the alleged decline of roadside communities, convincingly arguing for a continuous (even if possibly limited) use of the trail at least until the early 3rd century CE.¹⁰⁵ Around that time, the long-flagging international aromatics trade on the Incense Road collapsed;¹⁰⁶ nonetheless, the Petra–Gaza road retained some of its former importance as a Diocletianic military road, with a number of its stations repurposed by Roman forces as *limes* encampments in the last decades of the 3rd century CE.¹⁰⁷ Surviving as a local link between the Nabataean communities in the Negev and the Arabah, the Petra–Gaza road was finally abandoned in the second half of the 4th century CE, after a 363 CE earthquake destroyed Petra and the isolated Negev population turned entirely to subsistence farming.¹⁰⁸

4.3.2. *Leuke Kome–Petra–Rhinocolura road (Maps 5 and 6)*

At the turn of the 1st century BCE, the Nabataean incense merchants lost access to Gaza due to the territorial expansion of neighbouring Judea. Its warring king – Alexander Jannaeus of the Hasmonean dynasty – captured Gaza in 99 BCE, banned Nabataean caravans from entering the city, and seriously damaged their trade in aromatics.¹⁰⁹ How exactly the Nabataeans accommodated themselves to these developments remains unknown. Writing at the end of the 1st century BCE, Strabo describes and juxtaposes Nabataean- and Roman-controlled routes that brought aromatics into the Roman Empire. Strabo relates, at his time, the Nabataeans still brought incense

Table 4.4 Sites on/near the Incense Road between Gaza and Petra

Sites on/near the Incense Road between Gaza and Petra (modern/ancient name)	Type	Occupation in the Antiquity
Gaza	City	Continuous
Horvat Beer Shema (<i>Birsama?</i>) ¹	Village	(Late Nabataean?) – 1/2nd c. CE–Byzantine
Haluza (<i>Elusa</i>) ²	City	Late 4th c. BCE–Arab period
Horvat Ma'agurah ³	Caravanserai (Nabataean) / fort (Hasmonean)	2nd c.–1st c. BCE
Avdat (<i>Oboda/Eboda</i>) ⁴	City	Late 4th c. BCE–7th c. CE (with occupation breaks)
Grafon ⁵	Fortified road station	Late 2nd–early 3rd CE (?)
Mezad Ma'ale Mahmal ⁶	Fortified road station	Mid-1st–early 2nd c. CE/late 2nd–early 3rd c. CE/late 3rd–early 5th c. CE
Sha'ar Ramon ⁷	Fortified road station / caravanserai	Mid-1st c. CE–early 3rd c. CE/late 3rd c. CE–early 5th c. CE
Mezad Neqarot ⁸	Fortified road station / watchtower	Late 1st c. CE–early 2nd/late 2nd–early 3rd CE (222 CE?)
Har Massa ⁹	Road station	Late 1st c. BCE–early 2nd c. CE/3rd–4th c. CE
Horvat Qazra ¹⁰	Fortified road station / small open shrine	Late 1st c. BCE–early 3rd c. CE (222 CE?)
Moyat Awad (<i>Kalgouia?</i>) ¹¹	Caravanserai / fortified road station / industrial area of perfume production	3rd c. BCE–early 3rd c. CE (after 222 CE?), with three short occupation breaks
Khirbet Umm Qhuntera ¹²	Road station	Nabataean–Early Roman, Late Roman?
Khirbet Sufaysif ¹³	Caravanserai	Nabataean–Early Roman, Late Roman?
Petra ¹⁴	City	4th c. BCE–7th c. CE

¹ Musil 1907, 63; Abel 1938, 180; Avi-Yonah 1976, 43; Gazit and Lender 1991, 43–45; 1992, 33–39; Schmitt 1995, 93 (s.v. Berzama); Isaac 1998, 454 n. 73; Dolinka 2007, 111–118.

² Woolley and Lawrence 1915, 108–113; Negev 1969, 5–14; 1976, 89–95; Wenning 1987, 141–147; Negev and Schmitt-Korte 1983, 41; Schmitt 1995, 142–144; Erickson-Gini 2006, 157.

³ Isaac 1998, 456 n. 82; Erickson-Gini 2007, 4; Erickson-Gini and Israel 2013, 32–39.

⁴ Woolley and Lawrence 1914, 93–107; Negev 1996, 67–87, 1966, 95; Erickson-Gini 2014, 81–108.

⁵ Meshel and Tsafirir 1975, 10; Erickson-Gini 2006, 161; Erickson-Gini and Israel 2013, 28, 42.

⁶ Meshel and Tsafirir 1975, 11–12; Cohen 1983b, 69–70; Erickson-Gini 2007, 4; 2006, 161; Erickson-Gini and Israel 2013, 41–42.

⁷ Meshel and Tsafirir 1975, 12–14; Cohen 1982b, 87–88; 1988–1989, 164–165; Erickson-Gini 2006, 161; 2007, 4; Erickson-Gini and Israel 2013, 41.

⁸ Cohen 1982a, 86–87; Erickson-Gini 2006, 161; 2007, 4; Erickson-Gini and Israel 2013, 41–42.

⁹ Cohen 1983a, 69; Erickson-Gini and Israel 2003, 10; Erickson-Gini 2006, 161; Erickson-Gini and Israel 2013, 41.

¹⁰ Erickson-Gini and Israel 2003, 10; Erickson-Gini 2006, 161; Erickson-Gini and Israel 2013, 41.

¹¹ Meshel and Tsafirir 1975, 20; Schmitt 1995, 200; Erickson-Gini 2006, 161; 2007, 3–4; Erickson-Gini and Israel 2013, 44–49.

¹² Smith 2010, 42–43; Erickson-Gini and Israel 2013, 50.

¹³ Smith 2010, 37–39; Ben-David 2012, 21–23; Erickson-Gini and Israel 2013, 50.

¹⁴ Ortloff 1999, 93–109.

from their Red Sea port of Leuke Kome overland to Petra and then to Rhinocolura; however, he stresses that Roman agents had taken over much of that trade, shipping Eastern goods from their Red Sea ports over the Eastern Desert and down the Nile to Alexandria (section 5.2.4 and 5.2.5).¹¹⁰ Connecting Strabo's testimony with Josephus' account on Jannaeus' conquest of Gaza, Pau Figueras suggested the Nabataeans ignored Gaza while it remained under the Jewish control, bringing their wares to Rhinocolura instead via Nessana and Qadesh Barnea.¹¹¹

A bold and intriguing conjecture, Figueras' idea gained qualified support among scholars. Following Figueras, Gentry argued the Nabataeans did not aid besieged Gaza in 99 BCE because they had other access corridors to the Mediterranean – among them via Rhinocolura.¹¹² Whether the Nabataeans actually diverted their traffic to that particular location remains contested. On one hand, the recently uncovered archaeological evidence in the western Negev corroborates the Hasmonean hold on the Nabataean trading routes. Having conquered Gaza, the Hasmoneans built bottleneck forts on the Petra–Gaza road (at Horvat Ma'agurah) (section 4.3.1), the Elusa–Nessana road (at Nessana) (section 4.3.3), and the Darb al-Ghazza (section 4.3.4), effectively choking much of the Mediterranean-bound Nabataean traffic; the blockade ended ca. 65 BCE, when the Nabataeans won back the western Negev from Alexander's son Hyrcanus II.¹¹³ Nevertheless, the same body of evidence indicates the Nabataeans could not have responded with rerouting their trade via Nessana, since Alexander Jannaeus had a fort built there. Later in his book, Figueras effectively undermines his own hypothesis. He admits that, according to Josephus, Alexander Jannaeus conquered not only Gaza, but Raphia and Rhinocolura as well.¹¹⁴ In other words, between 99 and 65 BCE, the Nabataeans were unlikely to sell their wares in Rhinocolura, Raphia, or Gaza; similarly, they could not enter Nessana, which also remained under the Hasmonean control. Significantly, Strabo's testimony indicates the Nabataeans visited Rhinocolura in the late 1st century BCE, in a political context very different from the one under the Hasmoneans; it might be that Strabo's trail to Rhinocolura was travelled only after 65 BCE.

As the conflicting evidence stacks, two questions remain. Did Nabataeans reroute their traffic during the Hasmonean occupation of Gaza, Raphia, and Rhinocolura, and if yes, to where? Furthermore, did the Nabataean caravans travel to Rhinocolura in Strabo's time, and if yes, what was their itinerary? As for the first question, we possess some evidence for the Nabataean presence near the Mediterranean coast during the Hasmonean phase. The Nabataean sites of Qasrawet, Khirbet Abu Shaqafa, and Quseima yielded remains dated to 1st century BCE,¹¹⁵ indicating the Nabataean caravans at that time could reach the shore via the longer trail leading through Quseima, Qasrawet, and Pelusium (section 4.3.3). Furthermore, it appears unlikely that the Hasmonean watchmen would be able to bar the Nabataeans from approaching the Mediterranean. Probably, the Jewish forts only bottlenecked and constrained the nomadic movement in the region, with the Nabataeans adapting by plying lesser, more circuitous trails.

As for the second question, Rhinocolura could have been one of the Nabataean coastal termini in Strabo's time, but probably not the most significant one – that

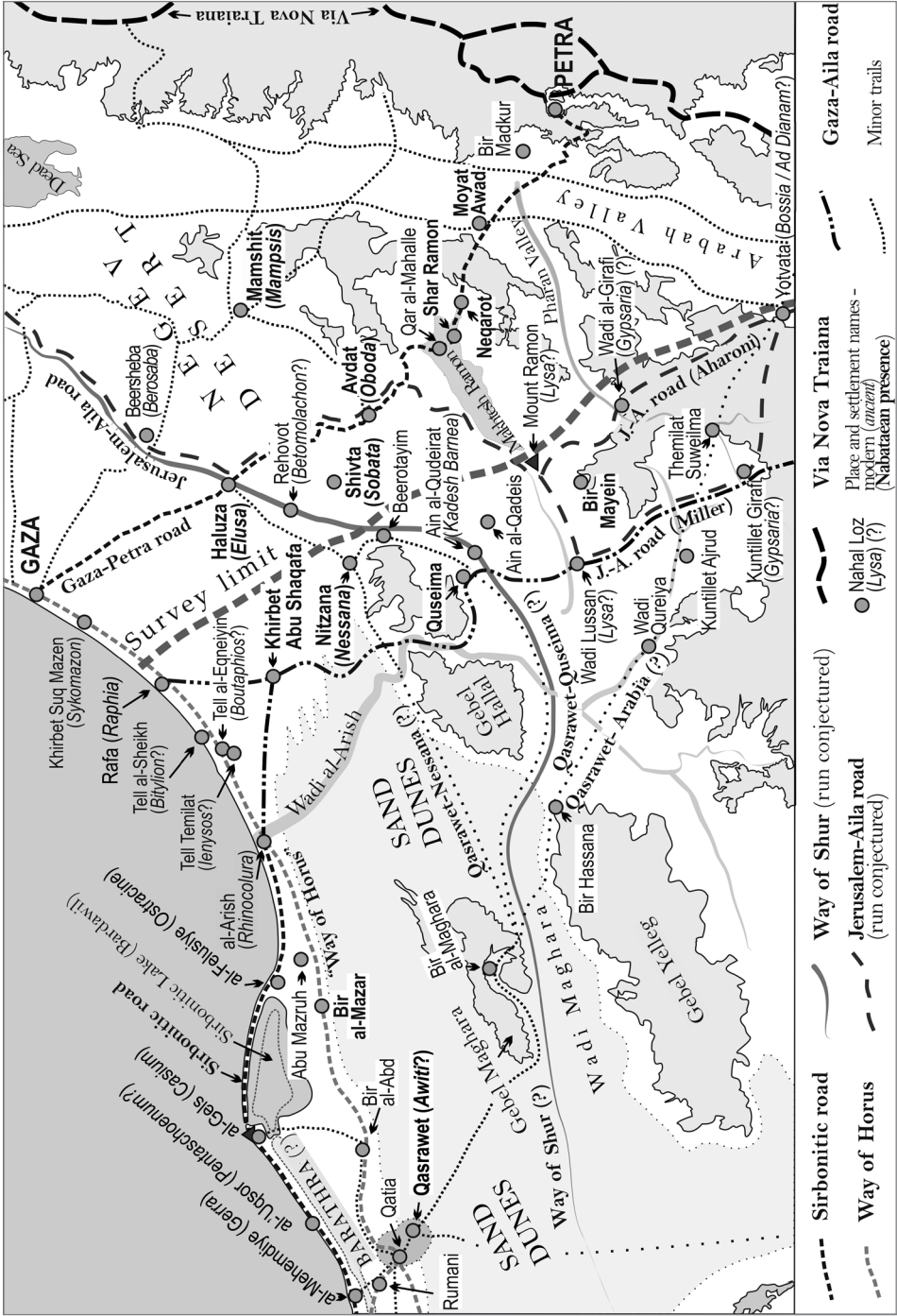


Fig. 4.4 Map 5 – Northeastern region of Sinai and Negev Desert

Map 5 – The northeastern region of Sinai and the Negev Desert

Shifting sands, saline marshes, and craggy uplands of Northern Sinai create a challenging environment for charting ancient routes in the region. Out of many trails in the region, only the SIRBONITIC ROAD and the ‘WAY OF HORUS’ at the coast and GAZA–AILA and GAZA–PETRA roads in the interior can be mapped with a degree of certainty. Trajectories of other trails remain conjectural. The Roman era-traffic concentrated on the Mediterranean-facing roads, whereas the Nabataeans mostly plied trails in the desert interior.

Maps and materials consulted: Aharoni 1954, 13, fig. 2; Meshel and Tsafir 1974, 104, fig. 1, 107, fig. 2; Meshel 1981; 2000, 100, fig. 1, 106, fig. 5; Figueras 1988, 65; 2000, 8, fig. 1; Barrington Atlas (ed. Talbert 2000), maps 70, 76; Smith 2010, 37–39, 42–43; Ben-David 2012, 19, fig. 1, 22, fig. 5; Erickson-Gini and Israel 2013, 26, fig. 1; Gentry 2017: 25–26.

‘WAY OF HORUS’/MEDITERRANEAN COASTAL ROAD (section 4.2.1): Tell al-Farama (*Pelusium*) (not depicted) → Rumani → Qatia → Bir al-Abd → Bir al-Mazar → al-Arish (*Rhinocolura*) → Tell Themilat (*Ienysos*?) → Tell al-Eqneiyin (*Boutaphios*?) → Tell al-Sheikh (*Bitylion*?) → Rafa (*Raphia*) → Gaza → [northeast to Palestine and Syria]

SIRBONITIC ROAD (section 4.2.2): Tell al-Farama (*Pelusium*) (not depicted) → al-Mehemdiye (*Gerra*) → al-Uqsor (*Pentashoenum*?) → al-Gels (*Casium*) → al-Felusiye (*Ostracine*) → al-Arish (*Rhinocolura*) → [joins the ‘Way of Horus’]

GAZA–PETRA ROAD (section 4.3.1): Gaza → Haluza (*Elusa*) → Avdat (*Oboda*) → Qar al-Mahalle → Shar Ramon → Mezad Neqarot → Moyat Awad (*Kalgouia*?) → Petra

LEUKE KOME–PETRA–RHINOCOLURA ROAD (section 4.3.2): *Leuke Kome* (not depicted) → Petra → [conjecture: → Pharan Valley → Wadi al-Girafi (*Gypsaria*?) → Mount Ramon (*Lysa*?) → Wadi Lussan (*Lysa*?)] → Quseima → Khirbet Abu Shaqafa → al-Arish (*Rhinocolura*)

GAZA–AILA ROAD (DARB AL-GHAZZA) (section 4.3.4): al-Arish (*Rhinocolura*) [western terminus] | Rafa (*Raphia*) [eastern terminus] → Khirbet Abu Shaqafa [branches converge] → bed of Wadi al-Arish → Quseima → Wadi Lussan (*Lysa*?) → Kuntillet Girafi (*Gypsaria*?) → [southwards to Aila]

JERUSALEM–AILA ROAD (section 4.3.5): Jerusalem (not depicted) → Beersheba (*Berosaba*) → Haluza (*Elusa*) → Avdat (*Oboda*) → [further run uncertain]:

- [Schmitt’s reconstruction]: Wadi Lussan (*Lysa*?) → Kuntillet Girafi (*Gypsaria*?) → Yotvata (*Bossia*/Ad *Dianam*?) → [southwards to Aila]
- [Aharoni’s reconstruction]: Mount Ramon (*Lysa*?) → Mount Odeid (*Goubba*?) → Wadi al-Girafi (*Gypsaria*?) → Yotvata (*Bossia*/Ad *Dianam*?) → [southwards to Aila]

QATIA–QASRAWET–BIR MAGHARA–(NEGEV?) TRAIL (section 4.3.3): Qatia → Qasrawet (*Awiti*?) → Bir al-Maghara → [further run uncertain, possible extensions]:

- (1) → Bir Hassana → Wadi Qureiya → Themilat Suweilma → Uvda → Yotvata (*Bossia*/Ad *Dianam*?) → Arabah Valley → [southeast to southern Arabia?]
- (2) → [along the former Way of Shur] → Quseima
- (3) → Nitzana (*Nessana*) → Haluza (*Elusa*)

Map 6 – Desert trails of Negev

The accompanying map is a copy of the Northern Sinai map, redrawn in greater detail for the sake of clarity. The Roman era-traffic concentrated on the Mediterranean-facing roads, whereas the Nabataeans mostly plied trails through the desert interior. Settlements marked in bold yielded Nabataean material. Many minor Nabataean trails in Wadi Maghara and al-Tih Plateau cannot be plotted with any certainty; similarly, the trajectory of Jerusalem-Aila road between Avdat (*Oboda*) and Aqaba (*Aila*) is only a rough estimate.

Maps and materials consulted: Aharoni 1954, 13, fig. 2; Meshel and Tsafirir 1974, 104, fig. 1, 107, fig. 2; Schmitt 1995, 232–233; Meshel 1981; 2000, 100, fig. 1, 105, fig. 6; Figueras 1988, 65; 2000, 8, fig. 1; Barrington Atlas (ed. Talbert 2000), maps 70, 76; Ben-David 2012, 19, fig. 1, 22, fig. 5; Smith 2010, 37–39, 42–43; Erickson-Gini and Israel 2013, 26, fig. 1; Gentry 2017: 25–26.

GAZA–PETRA ROAD (section 4.3.1): Gaza (not depicted) → Horvat Beer Shema (*Birsama?*) → Haluza (*Elusa*) → Horvat Ma'agurah → Avdat (*Oboda*) → Grafon → Mezad Ma'ale Mahmal → Qar al-Mahalle → Shar Ramon → Mezad Neqarot → Har Massa → Horvat Qazra → Moyat Awad (*Kalgouia?*) → Khirbet Umm Khuntera → Khirbet Sufaysif → Petra

LEUKE KOME–PETRA–RHINOCOLURA ROAD (section 4.3.2): *Leuke Kome* (not depicted) → Petra → [conjecture: Khirbet Sufaysif → Khirbet Umm Khuntera → Pharan Valley → Wadi al-Girafi (*Gypsaria?*) → Mount Odeid (*Goubba?*) → Mount Ramon (*Lysa?*) → Wadi Lussan (*Lysa?*)] → Quseima → Khirbet Abu Shaqafa → al-Arish (*Rhinocolura*)

'WAY OF HORUS'/MEDITERRANEAN COASTAL ROAD (section 4.2.1): Tell al-Farama (*Pelusium*) (not depicted) → Bir al-Mazar → al-Arish (*Rhinocolura*) → Tell Themilat (*Ienyso?*) → Tell al-Eqneiyin (*Boutaphios?*) → Tell al-Sheikh (*Bitylion?*) → Rafa (*Raphia*) → [coastwards to Gaza and beyond]

SIRBONITIC ROAD (section 4.2.2): Tell al-Farama (*Pelusium*) (not depicted) → al-Felusiye (*Ostracine*) → al-Arish (*Rhinocolura*) → [joins the 'Way of Horus']

GAZA–AILA ROAD (DARB AL-GHAZZA) (section 4.3.4): al-Arish (*Rhinocolura*) [western terminus] | Rafa (*Raphia*) [eastern terminus] → Khirbet Abu Shaqafa [branches converge] → bed of Wadi al-Arish → Quseima → Wadi Lussan (*Lysa?*) → [trail bifurcates]:

- [Hellenistic – Nabataean track]: Wadi Lussan (*Lysa?*) → [eastwards] → Bir Mayein → [southwest to Themilat Suweilma]
- [Late Roman (?) – Byzantine track]: Wadi Lussan (*Lysa?*) → [south-east-south to Kuntillet Girafi]

JERUSALEM–AILA ROAD (section 4.3.5): Jerusalem (not depicted) → Beersheba (*Berosaba*) → Haluza (*Elusa*) → Horvat Ma'agurah → Avdat (*Oboda*) → [further run uncertain]:

- [Schmitt's reconstruction]: Wadi Lussan (*Lysa?*) → [follows Darb al-Ghazza]
- [Aharoni's reconstruction]: Mount Ramon (*Lysa?*) → Mount Odeid (*Goubba?*) → Wadi al-Girafi (*Gypsaria?*) → [southwest to Yotvata and Aila]

QATIA–QASRAWET–BIR MAGHARA–(NEGEV?) TRAIL (section 4.3.3): Qatia → Qasrawet (*Awiti?*) → Bir al-Maghara → [further run uncertain, possible split]: (1) Bir Hassana → Wadi Qureiya → [continue southeast to Themilat Suweilma and Arabia (?)] | (2) → Quseima | (3) → Nitzana (*Nessana*) → Haluza (*Elusa*)

distinction returning to Gaza. Why Strabo would point to Rhinocolura, instead of Gaza, as the chief terminus for the Nabataean incense trade remains ambiguous. Either he relied on outdated information, or – more probably – he unknowingly witnessed the ongoing adjustment in the Nabataean trading patterns. In my view, the Mediterranean terminus for the Nabataean aromatics trade would shift eastward with the improving political situation. Under the oppressive Hasmoneans (99–65 BCE), the caravans from Petra would take a detour to Pelusium (Quseima → Bir al-Maghara → Qasrawet) (section 4.3.3). In the mid-1st century BCE, the Nabataeans would shorten their itinerary and move the terminus to Rhinocolura. Setting out from Petra, they could travel through the eastern Negev (Wadi al-Girafi → Bir Mayein?) and then along Darb al-Ghazza (Wadi Lussan → Quseima → Khirbet Abu Shaqafa) to the coast (section 4.3.4). In Strabo's day (the end of the 1st century BCE), the Nabataeans would reopen the Petra–Gaza road (section 4.3.1); the geographer witnessed the dwindling trade on the Petra–Rhinocolura trail, but he did not know where the caravans went. Finally, by Pliny's day (the late 1st century CE), the Nabataeans exported most of their wares along the road to Gaza, as they did before 99 BCE,¹¹⁶ even if they faced growing competition from the Roman Red Sea trade. The hypothesised itinerary shift tallies with the currently-known extent of the Hasmonean reach into the western Negev. Needless to say, were new Jewish forts discovered to the west of Nessana, the proposed trade pattern scheme would have to be redrawn; even so, the enduring Nabataean presence at Qasrawet and Quseima in the 1st century BCE points to some kind of trading activity in the Sinai interior on the line between Petra and Pelusium.

4.3.3. Qatia–Qasrawet–Bir al-Maghara–(Negev?) trail (Maps 5 and 6)

To the south of Gerra, one finds the mysterious twin settlements of Qatia and Qasrawet, long recognised as local traffic nodes due to their convenient location and access to plentiful water sources.¹¹⁷ Two commerce-oriented ancient sites, Qatia and Qasrawet, bafflingly left no trace in the Graeco-Roman sources, which led some scholars to argue that they tapped into a network of trading routes altogether unknown to Egyptian authorities – routes plied by the Nabataeans in the northern Sinai. Much ink has been spilled over the conjectured itineraries that would link Qatia and Qasrawet to Nabataean settlements in the Negev and beyond, sadly to no avail, as the inhospitable region through which these trails would have left remains understudied archeologically. In the current section of this work, I reassess the evidence for and against these trails' existence. First, I consider the archaeological milieu of Qatia and Qasrawet and then discuss their possible connections to the Negev cities and Petra, plotting trails drawn by other scholars and appraising their viability.

QATIA AND QASRAWET AS NABATAEAN SITES

Out of two, an idyllic palm oasis of Qatia, situated two kilometres south from the modern road from Egypt to Israel, once constituted a major desert trail hub for both

Nabataean and non-Nabataean traffic.¹¹⁸ Diverging branches of the 'Way of Horus' connected Qatia to Sile and Pelusium;¹¹⁹ in addition, other yet unmapped paths almost certainly linked the oasis to Casium and Gerra at the coast and Qasrawet in the hinterland (sections 4.4.2 and 4.4.3). The body of archaeological evidence at Qatia suggests, but does not confirm, the Roman-era occupation. Early 20th century surveyors to the area recorded pre-Islamic tell structures, with the surface finds including pieces of granite, glass, marble, and Roman pottery shards.¹²⁰ Interpretations of finds diverge. Clédât argues for the antiquity of the site and claims local Arabic stonework repurposes Roman-era marbles, whereas Verreth qualifies Clédât's dating with a warning that pre-Islamic marbles could have easily come from neighbouring sites.¹²¹ One way or another, Qatia certainly attracted traders between the coast and the hinterland, some proceeding further to its sister site of Qasrawet.

Located eight kilometres southeast from Qatia, the baffling Nabataean-Roman site of Qasrawet was first explored by Clédât (1910–1911) and then by Oren (1975–1976) but still awaits a large-scale excavation.¹²² An unfortified settlement amidst moving dunes, Qasrawet was founded by Nabataeans in the 2nd century BCE as a constellation of temporary camping sites.¹²³ Best described as a caravanserai, core sites comprised storage and cooking facilities, several necropoleis, and a small religious shrine erected in the 1st century BCE.¹²⁴ In the 1st century CE, inhabitants of Qasrawet grew affluent and abandoned tents in favour of monumental architecture. The local shrine underwent an extensive restoration and expansion, with another, larger temple erected nearby.¹²⁵ Thriving in the first two centuries of our era, the Nabataean Qasrawet depended on Egyptian trade markets; weakened by Egypt's growing instability, it faced increasing pressure from desert nomads, to be abandoned in the late 2nd or early 3rd century.¹²⁶ After a lengthy hiatus, Qasrawet re-emerged in the 4th century CE as a thickly-walled Roman *castrum*, most likely a desert border fort for the newly created Augustamnica province. Occupied only for a short time, the settlement emptied and fell into disrepair towards the end of the 4th century CE.¹²⁷

Significantly, Qasrawet has left no discernible trace in classical sources; similarly, attempts to identify Qasrawet with a Nabataean toponym yielded inconclusive results.¹²⁸ At Qasrawet's older shrine, Clédât found a dedication dated to 1st century BCE, eventually linked by Starcky to pre-Islamic Arabian goddess al-Kutba'.¹²⁹ In consequence, Starcky and Strugnell persuasively identified Qasrawet with *Awiti*, a Nabataean shrine of al-Kutba' mentioned in a 1st century CE inscription from Tell al-Shuqafiya in the Wadi Tumilat in Egypt; nonetheless, scant corroborative evidence makes this tantalising identification unconfirmable.¹³⁰ On the other hand, Tsafirir identifies Qasrawet with the unnamed capital city of an Arab tribe of Autaei, mentioned by Pliny.¹³¹ A bustling trade centre in his day, the settlement's name curiously did not find its way into Pliny's account.¹³² To conclude, the linguistic similarity between *Awiti* and *Autaei/Autai* implies, but does not confirm, both toponyms refer to the same area centred around Qatia and Qasrawet.¹³³

TRAILS STRIKING FROM QASRAWET TO THE EAST

A suspicious exclusion of a major Nabataean trading centre from major classical accounts on the region suggests Qasrawet tapped into another network of trading routes, one largely unknown to Graeco-Roman authorities. It stands to reason that it was a terminus for trails that linked it to other Nabataean sites to the east and south. Whether the direct road connection between Qasrawet and the Negev existed remains uncertain, since no road traces survive in the dune field skirting Qasrawet from the south.¹³⁴ The original explorer of Qasrawet, Clédat put forward in 1916 that a long-distance trail once linked Pelusium to Petra via Qatia, Qasrawet, and Wadi Maghara,¹³⁵ sparking off a simmering dispute that lasts to this day.¹³⁶ Attacking Clédat, Oren and Tsafir initially challenged the existence of this trail, proposing to classify Qasrawet solely as a station on the Plinian road linking Gerra to Cleopatris (section 4.4.3). In turn, others concurred with Clédat and charted a trail striking southeast from Qasrawet to Bir al-Maghara, a remote watering hole in the Gebel Maghara massif.¹³⁷ The subsequent discovery of imported Koan and Knidian amphorae (dated to the 2nd–1st century BCE) at both Qasrawet and Bir al-Maghara ostensibly corroborated Clédat's theory about at least semi-regular traffic between Qasrawet and sites to the southeast of it;¹³⁸ nevertheless, according to Eliezer Oren, the pottery assemblages at Bir al-Maghara included no Nabataean material and thus the site cannot be identified as a part of their trading network.¹³⁹ Taking all of the above into account, the extent and direction of Nabataean trails leading from Qasrawet through Bir al-Maghara remains contentious: what follows is a conjectural consideration of possible links between these sites and Negev.

Considering the topography of northern Sinai, a Nabataean trail from Qasrawet via Bir al-Maghara could: (1) continue directly southeast to Arabia, (2) turn east and make for Quseima, or (3) swerve east-north-east to Nessana and onwards to Elusa. One way or another, it would have to cross Wadi Maghara, a broad east–west hollow, lodged between Gebel Maghara to the north and Gebel Yelleg and Gebel Hallal to the south. Due to the inherently flexible nature of desert travel and lack of current archaeological data on Wadi Maghara, all three trajectories remain conjectural until explicitly proven. At this stage of research, the reasonable way to proceed is to estimate which of the three traffic nodes (Arabia, Quseima, Nessana) would have held greater attraction for hypothetical Nabataean caravans setting out from Qasrawet.

The first trajectory (1) would have the trail omit Petra altogether. According to Meshel, the considered trail from Qasrawet linked incense-bearing lands of Arabia directly to the Mediterranean port at Pelusium (Pelusium → Qasrawet → Bir al-Maghara → Bir Hassana → Wadi Qureiya → Themilat Suweilma → Uvda → Yotvata → Wadi Araba → southern Arabia).¹⁴⁰ An intriguing yet implausible trajectory, Meshel's proposal presupposes an entire network of hitherto unknown Nabataean trails radiating from an otherwise unknown watering hole at Themilat Suweilma. The Qasrawet–Themilat Suweilma trail would lead through rough, waterless terrain and past remote sites that yielded little to no Nabataean material. To avoid the trading opportunities of Petra

in favour of distant Arabian trading posts seems impractical at best and dangerous at worst. Little more than a connect-the-dots line on the map, Meshel's trajectory cannot be approved or disproved unless further evidence on specified road sites comes to light.

Other scholars opted for a more conservative approach and linked the Qasrawet to Petra via (2) Quseima or (3) Nessana.¹⁴¹ Of these two options, Quseima lies closer to Bir al-Maghara and has Nabataean installations dated from 1st century BCE to 1st century CE.¹⁴² Situated at an important trail crossroads on Darb al-Ghazza (section 4.3.4) and, possibly, the Way of Shur (section 4.2.3), Quseima would definitely attract incoming traffic from Bir al-Maghara. In fact, the trail via Quseima (Quseima → Bir al-Maghara → Qasrawet → Qatia → Pelusium) was probably plied by the incense caravans during the period when the Hasmoneans banned the Nabataeans from Gaza (99–65 BCE) (see section 4.3.2).

Alternatively, caravans leaving Bir al-Maghara could turn east-north-east (3). Such an itinerary skirts Gebel Hallal from the north, traverses Wadi al-Arish, and subsequently crosses Darb al-Ghazza (section 4.3.4) between Khirbet Abu Shaqafa and Quseima, as it continues to Elusa and other Nabataean settlements. A well-walked road, the trail section between Elusa and Nessana shows evidence of being plied under the Nabataeans;¹⁴³ nonetheless, whether it extended further west through barren Wadi Maghara remains uncertain. As a concluding remark, it appears that all three possible trail branches could be travelled, the choice depending on specific needs of a given caravan. In terms of traffic volume, however, the trails connecting Bir al-Maghara to Quseima (2) and Nessana (3) seem to be the best and most convenient connections between Qasrawet and the Negev, should such a link be plied in the first place.

4.3.4. Gaza–Aila road (Darb al-Ghazza) (Maps 5 and 6)

An important connection between the Gulf of Aqaba and the Mediterranean, the so-called Darb al-Ghazza (Gaza Road) linked the port of Aila (Red Sea/Gulf of Aqaba) to harbours at Gaza, Raphia, and Rhinocolura. An easy-going trail, Darb al-Ghazza parallels the Gaza–Petra road and the modern Egypt-Israel border. As such, it skirts the jagged Negev uplands from the west, traversing broad gravel plains and wadis of the eastern Sinai.¹⁴⁴ This ancient but rather vaguely delineated nomad migration corridor shows signs of having been travelled in the Early Bronze Age; nevertheless, it became a significant trading trail only from the Iron Age onwards. Relevantly, the available survey and excavation data from the region around Darb al-Ghazza show uneven diachronic distribution, indicating intermittent trail use. Surveys at the roadside sites uncovered little archaeological evidence dated to Persian (539–332 BCE) and Roman (106–324 CE) periods, in contrast to better represented Hellenistic–Nabataean (332 BCE–106 CE) and Byzantine (324–640 CE) periods.¹⁴⁵ In comparison to the parallel Gaza–Petra road, the remote Gaza–Aila track remains poorly surveyed and understudied. What little research has been done indicates the trail shifted in space from era to era and lacked major roadside installations,¹⁴⁶ presenting a challenge to one attempting to plot it.

THE RUN OF THE ROAD

At its Mediterranean terminus, the Darb al-Ghazza has no clearly defined and agreed-upon starting point. The preeminent specialist on Darb al-Ghazza's ancient run, Ze'ev Meshel, initially argued the trail diverged from the 'Way of Horus' somewhere south of Gaza (near to ancient Sykomazon?) and struck directly southward to Nessana and Quseima.¹⁴⁷ Untypically, Meshel's proposed run of the trail between Gaza and Nessana lacked even the simplest roadside installations. Accordingly, the archaeologist subsequently updated his reconstruction and shifted the road's Mediterranean terminus to the west. According to the new interpretation, the road began not as a single track at Gaza but as two feeder trails, striking from Rhinocolura (al-Arish) and Rafa (Raphia), and converging 20 kilometres south of the coast at a significant Nabataean road station at Khirbet Abu Shaqafa (active between the 1st century BCE and 2nd century CE).¹⁴⁸ From that point onward, the trail would proceed southwards through sharply undulating sands and scrubland, follow the bed of Wadi al-Arish through its gorge in the Gebel Hallal and, at some point, cross the hypothetical trail that linked Elusa and Nessana to Qasrawet (section 4.3.3). The next road station on Darb al-Ghazza was Quseima, a remote valley site with an Iron Age fortress (often called 'Aharoni fortress' after its excavator)¹⁴⁹ and a scattered Nabataean agricultural settlement (occupied between 1st century BCE–1st century CE) that stored rainwater in chalk-hewn cisterns.¹⁵⁰ Having surveyed the site, Meshel connected the village's existence to the trail crossroads.¹⁵¹ At Quseima, tracks leading from the Mediterranean to the Red Sea crossed those from the Negev to Egypt, one of them possibly to be identified with the biblical Way of Shur (section 4.2.3).¹⁵²

In contrast to the often-disputed run of the northern section of the road, its central segment between Quseima and Kuntillet Girafi does not stir up major academic controversy.¹⁵³ Striking southward from Quseima, the track bypassed the historic Ain al-Qudeirat spring (Kadesh Barnea), a fortified Israelite oasis site occupied between the 12th and 6th century BCE and possibly up to the 4th century BCE.¹⁵⁴ Continuing southwards through monotonous plains, the track approached the bed of Wadi Lussan and forked into two parallel branches, eastern and western.

The eastern branch, probably used in the Hellenistic-Nabataean period, swung east, crossed Wadi Lussan, and continued southeast to the wells at Bir Mayein, where surveys uncovered remains of a poorly dated Nabataean tomb.¹⁵⁵ Further on, the eastern branch sidestepped the Palaeolithic worship site at Har Karkom and headed for an otherwise undistinguished watering hole of Themilat Suweilma, where it crossed the bed of Wadi Girafi and continued south, eventually to merge with the western branch south of Kuntillet Girafi.¹⁵⁶ At Themilat Suweilma, a side branch is believed to have split off and struck east across the Arabah towards Ain Gharandal,¹⁵⁷ the site of former Nabataean/Romano-Byzantine fortified settlement of Arindela.¹⁵⁸

In turn, the western branch of the road, walked in Roman, Byzantine, and Islamic periods, struck south-east-south towards Kuntillet Girafi, paralleling the modern macadamised Darb al-Ghazza. Faint yet intriguing traces of Roman- and Byzantine-era

traffic appear along the trail and await further exploration.¹⁵⁹ For example, the trail bypasses mysterious ruins on the southern bank of Wadi Lussan, alternatively identified as a road station or farm and tentatively dated to the Late Roman period (4th century CE).¹⁶⁰ After crossing the bed of Wadi Qureiya, the track approached Kuntillet Ajrud (Hebr. Horvat Teman), a running well with a briefly occupied Early Iron Age site (late 9th/early 8th century BCE), tentatively identified as an early Israelite shrine¹⁶¹. A prominent desert trail crossing, Kuntillet Ajrud, had once been identified with the Roman road station of Gypsaria. In 1967, Beno Rothenberg disproved the identification and demonstrated that the site had long been vacant in the Nabataean-Roman era; abandoned or not, Kuntillet Ajrud remained the only water source in the inhospitable area and thus might have attracted and funnelled some of the local traffic.¹⁶² Today, it is commonly held that the Nabataean-Roman trail did not go directly via Kuntillet Ajrud but rather followed the modern Darb al-Ghazza about 13 kilometres to the east.¹⁶³ Continuing southeast, the trail traversed Wadi Girafi and reached Kuntillet Girafi, where it left the modern macadamised road, swerved somewhat to the east, and joined the eastern trail branch.

The southern, final section of the ancient Darb al-Ghazza remains perhaps the least studied of all, apparently coming into use only after the decline of the Nabataeans.¹⁶⁴ Striking south-east-south from Kuntillet Girafi to Aila, the road went past a series of undated ancient tombs and Christian stone inscriptions in Greek; according to Meshel, it then diverged for the last time, with one branch (probably walked in the Byzantine period) veering south-west-south towards Wadi al-Hisi and St. Catherine's monastery of the southern Sinai and the other branch (Nabataean-Roman?) continuing south-east-south towards the head of the Gulf of Aqaba and Aila.¹⁶⁵ Meshel's diachronic reconstruction of the traffic patterns on Darb al-Ghazza suggests the Nabataean travellers arriving in Kuntillet Girafi did not strike for Aila; instead, they took a detour and headed east for Yotvata at the edge of the Arabah, connected to the trails leading to Arabia.¹⁶⁶ The sparse and late evidence along the Kuntillet Girafi-Aila trail implies, even in the Roman/Byzantine era, its importance came from the pilgrims taking the Wadi al-Hisi branch and travelling to the Sinai sites. As for pre-Islamic trail traffic headed directly to Aila, its volume remains unknown.

4.3.5. *Jerusalem–Elusa–Oboda–Aila road (Maps 5 and 6)*

Despite considerable strides desert road surveyors have made in identifying ancient roads on the basis of written and cartographical evidence, certain trails still elude their detection; in the Negev, one such trail is the road that purportedly led from Jerusalem through Elusa and Oboda to Aila. A poorly attested link, the Jerusalem–Aila trail crops up as a string of desert road station names, known only from two – not always accurate – sources, the Peutinger Map and Ptolemy's *Geography*.¹⁶⁷ The Peutinger Map (*Tabula Peutingeriana* = *T.Peut*), an illustrated itinerary showing the road network of the entire Roman Empire, survives as a 12th/13th century copy of a 4th century Roman original.¹⁶⁸ Regrettably, it is of limited use to desert road studies

due to numerous lacunae and discrepancies between recorded and actual station intervals. In a similar vein, Claudius Ptolemy's *Geography* (= *Ptol.*) (ca. 150 CE) entails a gazetteer section that records longitudes and latitudes of many desert sites in Egypt and Arabia; nonetheless, Ptolemy's data do not always tally with modern coordinates and sometimes led to incorrect identifications.¹⁶⁹

Table 4.5 records the trail as it proceeds from Jerusalem (Ἱεροσόλυμα) via Elusa (Ἐλουσα), Oboda (Ὀβόδα), Lysa (Λυσα), Gypsaria (Γυψαρία), (Ge)Rasa (Γερασά), and Ad Dianam to Aila(na) (Αἰλανά) at the head of the modern Gulf of Aqaba, with provided mile distances between stations.¹⁷⁰ In turn, Ptolemy provides the coordinates for all these stations save Ad Dianam,¹⁷¹ including an additional stop at Goubba (Γουββά) between Lysa and Gypsaria instead.¹⁷² The run of the trail between Jerusalem and Oboda has been mapped and does not fuel controversy. Striking south-west-south from the city, it went to Elusa and then followed the Gaza–Petra road until Oboda,¹⁷³ where it descended into parts unknown. Spurred on by *horror vacui*, explorers of the Negev propounded several possible trail extensions past Oboda; often, they added to the general scholarly confusion by disagreeing vehemently over stations' identifications. In consequence, I do not consider all possible conjectures but rather follow Schmitt's concise review of scholarship on the Oboda–Aila trail, discussing three trajectories most likely to match its ancient run: the Gaza–Petra trail/Incense Road (1), the Darb al-Ghazza road (2), and the Mount Odeid trail/Tariq al-Bayyana (3).¹⁷⁴

The first trajectory (1), proposed by Alt, has the trail follow the Incense Road from Elusa until it descends into the Wadi Araba, where the trail would veer south and follow the longitudinal connecting route until reaching Aila.¹⁷⁵ To equate this stretch of the Jerusalem–Aila road to the Incense Road partially comports with available archaeological evidence. The Incense Road's dense roadside installations could be identified with Lysa, Gerasa, and Gypsaria, whereas Ad Dianam would match one of the numerous forts in the Arabah, possibly Yotvata.¹⁷⁶ However, Roll and Avner convincingly argue that a traveller between Jerusalem and Aila would not travel via Elusa but rather to the shore of the Dead Sea and then directly south through the Arabah.¹⁷⁷ In contrast, the Table's stations suggest a tortuous journey through the Negev, first south-west-south to Elusa and then southeast and south to Aila. Furthermore, Aharoni compellingly demonstrates that, not only should at least some ancient names of stations between Oboda and Aila survive in toponyms of sites along the Incense Road – and they have not – but also the mile distances given in the Tabula should more visibly tally with distances on Alt's proposed itinerary.¹⁷⁸ In light of these reservations, the first conjecture appears unfounded and must be rejected.

The second trajectory (2) postulates that an Oboda–Aila crossing made use of the Darb al-Ghazza.¹⁷⁹ A hypothetical trail would leave the Gaza–Petra somewhere south of Oboda and run southwest until the edge of Makhtesh Ramon, an elongated erosion cirque in the middle of the Negev. The trail would then hug the northern edge of the cirque and slide into the Wadi Lussan, running southwest until it crossed Darb

Table 4.5 Jerusalem–Elusa–Oboda–Aila road stations

<i>Jerusalem–Elusa–Oboda–Aila road stations (Greek) (Tabula Peutingeriana / Claudius Ptolemy, Geography)</i>	<i>Miles (T.Peut) Between/Total</i>		<i>Most significant modern identifications</i>
Jerusalem (Ἱεροσόλυμα) (T.Peut 8.5)	0	0	Jerusalem
Elusa (Ἐλουσα) (T.Peut 8.5, Ptol. 5.15.7)	71	71	Halusa
Oboda (Ὀβόδα) (T.Peut 8.5, Ptol. 5.16.4)	24	95	Avdat
Lysa (Λυσα) (T.Peut 8.5, Ptol. 5.16.4)	48	143	Wadi Lussan (?) ¹ ; Har Ramon (?) ²
Goubba (Γουββα) (Ptol. 5.16.4)	-	-	Beer ‘Obeid (?) ³ ; Bir Mayein (?) ⁴
Gypsaria/Cypsaria (Γυψαρία) (T.Peut 8.5, Ptol. 5.16.4)	28	171	Kuntillet Ajrud (?) ⁵ ; Kuntillet Girafi (?) ⁶ ; Wadi Girafi (?) ⁷ ; Themilat Suweilma (?) ⁸
(Ge)Rasa (Γερασα) (T.Peut 8.5, Ptol. 5.16.4)	16	187	Themilat Suweilma (?) ⁹ ; Wadi Ghabiya (?) ¹⁰
Ad Dianam (T.Peut 8.5)	16	203	Yotvata (?) ¹¹
Aila/Aelana (Αἰλανα) (T. Peut, Ptol. 5.16.1)	16	219	Aqaba
BOLD = as yet unidentified	IN TOTAL	219	

¹ Palmer 1871, 347–348; Abel 1938, 227; Aharoni 1954, 10; Avi-Yonah 1976, 76; Schmitt 1995, 233.

² Aharoni 1954, 14.

³ Aharoni 1954, 15–16; Avi-Yonah 1976, 63.

⁴ Schmitt 1995, 177.

⁵ Abel 1938, 214.

⁶ Avi-Yonah 1976, 63.

⁷ Aharoni 1954, 13, 16.

⁸ Schmitt 1995, 178.

⁹ Abel 1938, 216.

¹⁰ Aharoni 1954, 16.

¹¹ Smith 2010, 30–32; against Yotvata: Isaac 2015, 45; 2017, 340–341; Frank 1934, 232–233, 239–240; Meshel 1989, 229, n. 6.

al-Ghazza. From Wadi Lussan, commonly identified with Lysa,¹⁸⁰ the trail would follow Darb al-Ghazza southeast to reach Gypsaria either at Kuntillet Girafi¹⁸¹ or at Themilat Suweilma;¹⁸² subsequently, the track would either turn east and descend into the Arabah at Yotvata (often identified with Ad Dianam) or continue directly south to Aila. Perhaps the most commonly accepted trajectory, the Oboda–Aila crossing via Wadi Lussan and Darb al-Ghazza, is seen as plausible enough to be featured in the Barrington Atlas (map 76) as far south as Kuntillet Girafi, with an extension towards Yotvata (tentatively identified with Ad Dianam).¹⁸³

Despite its popularity among scholars, the proposed trajectory still poses some problems. Schmitt notes that mile distances in the Table correspond closely with

those on the Wadi Lussan/Darb al-Ghazza itinerary,¹⁸⁴ but stresses the itinerary itself is surprisingly convoluted. To cross from Oboda to Aila, the easiest way leads via the Incense Road and then south along the Arabah (see trajectory 1 above); in turn, to travel from Elusa to Aila, the best crossing goes via Nessana and then along Darb al-Ghazza.¹⁸⁵ Crucially, the inclusion of Oboda among the road stations makes any direct crossing impossible. Schmitt concludes the Tabula copyist could have erroneously inserted Oboda into the itinerary¹⁸⁶ or even randomly picked a line of road stations, without regard for whether an actual road linked them.¹⁸⁷ As for the archaeological evidence, previous surveys in the area of Makhtesh Ramon uncovered some promising Nabataean- and Roman-era sites along the track between Oboda and Wadi Lussan;¹⁸⁸ nonetheless, little material data came from the sites along Darb al-Ghazza (section 4.3.4). Bearing in mind that Darb al-Ghazza – in particular the region southeast of Kuntillet Girafi – still awaits a comprehensive archaeological survey, it is difficult to arrive at any conclusions regarding this trajectory.

Finally, the third trajectory (3), proposed by Aharoni in 1954, plots the trail weaving its way between the Incense Road and Darb al-Ghazza. A combination of trajectories one and two, Aharoni's trail would depart from Avdat/Oboda and strike southwest along the edge of Makhtesh Ramon until the head of Wadi Lussan near Mount Ramon (Lysa?), where it would veer southeast, go past Mount Odeid (Goubba?), and cross beds of numerous wadis before descending into the Arabah at Yotvata (Ad Dianam?) and striking south for Aila.¹⁸⁹ Among three proposed trajectories, Aharoni's conjecture is corroborated by archaeological findings. First investigated in the early 20th century by Alois Musil and Fritz Frank, the windrowed track between Avdat and Mount Odeid navigates the steeper slopes through elaborately hewn passages, abutting remains tentatively dated to the pre-Islamic period: tombs, foundations of houses, ruined watchtowers, and pottery heaps.¹⁹⁰ Near Mount Odeid, the hitherto highly visible trail bypasses a ruined settlement (Aharoni's Goubba?) and disappears from the surface. The road, at this point referred to as Tariq al-Bayyana by Frank, reappears in the Uvda Basin to the southeast, with road tracks (windrows and rock cut descents) extending in the direction of Yotvata,¹⁹¹ traditionally identified by Aharoni with Ad Dianam.¹⁹²

Among three proposed trajectories, Aharoni's trail distinguishes itself by its reliance on archaeological evidence gathered by early explorers in the area. It seems fairly certain that a road of some antiquity did link Makhtesh Ramon to Yotvata via Mount Odeid.¹⁹³ Of course, the main limitation is the lack of broader post-1950s surveys and excavations at the roadside sites and in the general area of the trail. Although compelling, Aharoni's identification of Tariq al-Bayyana with Oboda-Aila trail must remain uncertain until more data is collected. Another problem with Aharoni's trajectory stems from the distance discrepancy. Aharoni's Lysa (Mount Ramon at the southeastern fringe of Makhtesh Ramon) and Avdat (Oboda) have 41 kilometres between them, whereas the Table specifies 47 miles or 70 kilometres. Aharoni glibly amends the distance to 27 miles or 40.5 kilometres, contorting the evidence to fit a preconceived identification and thus undermining his credibility. Finally, Aharoni's trajectory shares the convolutedness of two previous itineraries. Although it is a

marginally more direct crossing between Jerusalem and Aila, it still reads as a rather lengthy detour, lending weight to Schmitt's theory that Oboda was wrongly inserted into the road station line-up. Building on that assumption, Meshel hypothesises that the Table's copyist or original compiler extracted the toponyms almost verbatim from Ptolemy, for whom they never represented a major road or any traversable road at all.¹⁹⁴ In sum, one can neither prove nor disprove the existence of the Jerusalem–Aila trail until more evidence for or against it comes to light.

4.4. Trails linking the Mediterranean to the Gulf of Suez

On the eastern fringe of Egypt, an artificial canal diverted from the Nile near Memphis and linked it via the Great Bitter Lake to the tip of the Suez (Heroonpolitan) Gulf.¹⁹⁵ The region around the Gulf constituted a significant road junction, with the water traffic coming from the Mediterranean, the Nile, and the Red Sea and the overland traffic from Egypt, the Sinai Peninsula, and the Levantine coast. As such, it was densely settled, with Graeco-Roman sources speaking of at least three major cities (Arsinoe, Cleopatra, and Clysma). As literary sources provide us with conflicting data, identification of these sites presents special difficulties. It remains uncertain whether Arsinoe, Cleopatra, and Clysma were toponyms for three occupational phases of one site or, alternatively, three synchronously occupied neighbouring sites.¹⁹⁶ Founded under Ptolemy II, Arsinoe was probably later renamed Cleopatra by one of the later Ptolemies, conceivably in honour of Cleopatra VII.¹⁹⁷ Clysma, a Red Sea port of indefinite relation to two previous settlements, was renowned in the Late Roman period for its frequent services to India.¹⁹⁸ Curiously, earliest literary references to Clysma appear in the 2nd century CE, whereas archaeological works in the region of Qolzum unearthed a foundation on an orthogonal plan, tentatively dated to the Ptolemaic period.¹⁹⁹ Currently, the final identification of these settlements remains out of our reach. Under these circumstances, this study will refer to the Early Roman settlement at the tip of the Suez Gulf as Cleopatra, using other names only when sources specify them.

Herodotus and Pliny the Elder relate that the Cleopatra region had a direct road link to the Mediterranean, a convenient all-year alternative to the more circuitous and seasonally navigable Nilotic canal.²⁰⁰ Nevertheless, to travel by land entailed traversing or circumventing the triangular swath of dunes that extended between Cleopatra, Sile, and Rhinocolura, vividly described by Strabo as a sandy, reptile-infested wasteland negotiable only by smaller camel caravans.²⁰¹ The number of traversable trails apparently increased between the Persian and Roman periods. Herodotus knows of one trail of thousand stadia that struck from Casium for the Gulf of Suez (purportedly the shortest accessible connection),²⁰² whereas Pliny enumerates no less than three termini for trails striking northwards from Cleopatra/Arsinoe:²⁰³

[...] the whole of the journey from the Egyptian Sea is usually performed by land one of the three following ways: – Either from Pelusium across the sands, in doing which the only method of finding the way is by means of reeds fixed in the earth, the wind immediately effacing all traces of footsteps: by the route which begins two miles beyond Mount Casius,

and at a distance of sixty miles enters the road from Pelusium, adjoining to which road the Arabian tribe of the Autaei dwell; or else by a third route, which leads from Gerrum, and which they call Adipsos, passing through the same Arabians, and shorter by nearly sixty miles, but running over rugged mountains and through a district destitute of water. All these roads lead to Arsinoe [...]. (Pliny the Elder, *The Natural History*, 6.166–167, trans. Bostock/Riley)

Like most trails in the region, three trails to Cleopatris were probably plied by Nabataean caravans, who monopolised desert traffic in all but the northernmost reaches of Sinai. Constituting a secondary desert road network, these three branches supplemented the Nile-Red Sea canal and the Sirbonitic road, enabling nomads to cross from the Mediterranean to the Red Sea without venturing into the borders of Egypt. Mapping the network of desert trails between the Mediterranean and the tip of the Gulf of Suez necessitates factoring in topographical obstacles and possible deficiencies in Pliny's cursory description. Building on Figueras and Tsafir's remarks,²⁰⁴ in the following sections, I map conjectured runs of these trails and tentatively identify sites adjacent to them.

4.4.1. Pelusium–Cleopatris trail (Maps 3 and 4)

We know Pliny's first road struck southwards from Pelusium, apparently traversing a featureless swath of dunes, where the only road marks were reeds fixed in the sand; significantly, the author does not stress scarce water resources along this route, implying it never strayed far from the edge of the cultivated land. Consequently, I suggest the shortest convenient trail between Pelusium and the tip of the Suez Gulf would first turn southwest towards the old settlements of Migdol and Sile, treading the boundary between the well-watered Delta and the sandier coastal plain, dotted by palm copses growing around numerous wells. At Sile, travellers along the trail would swerve south and follow the run of the modern Suez Canal, negotiating a path between the Balla, Timsa, and Bitter Lakes to the east and the advancing chains of the great triangular dune field to the east.²⁰⁵ Such a trail would satisfy Pliny's implicit specifications of being both sandy and not completely devoid of water. Shifting sands advancing to the west of the trail would necessitate marking its route with reeds, whereas lakes to the east could quench travellers' thirst before they arrived at Cleopatris. Since this trail would form a sweeping arc along the eastern boundary of the Delta and adjacent lands, it would not be the shortest crossing between the Mediterranean and the Red Sea; however, the relative abundance of water along its run would compensate for the lengthier passage.

4.4.2. Casium–Cleopatris trail (Maps 3 and 4)

Known to Herodotus, the trail between Casium and Cleopatris was the longest crossing of the three. The fact that it was known to Herodotus testifies to its importance in the Persian period, whereas its inclusion by Pliny implies it remained a convenient option for those who did not want to stray too far into the shifting sands of the dunes covering the Isthmus.²⁰⁶ The trail's terminus, Casium (modern al-Gels) was a

settlement at the foothills of eponymous Mount Kasion, which lent its name to the entire coastal region between Pelusium and Rhinocolura (*Kasiotis*).²⁰⁷ A hillock site permanently occupied at least from the Late Ptolemaic period onwards,²⁰⁸ Casium abutted the western shore of the salty Sirbonitic Lake (modern Lake Bardawil), varying levels of which periodically altered the regional topography.²⁰⁹ Consequently, plotting the ancient shoreline of the lake may hold the clue to the location where the trail to Cleopatra began.

Currently, Bardawil is made of two distinct basins linked by a narrow strait south of Casium. To the east, one finds Bardawil proper, a triangular lagoon extending towards former Ostracine; to the west, a narrower body of water extends towards former Gerra. The Casium promontory borders on the Sirbonitic spit (west to northeast) and the lake (southwest to east). To the south, the abovementioned strait separates Casium hillock from the al-Zugba headland, jutting out of the southern shore of Bardawil (see Map 3). The lake level fluctuated in Antiquity, but Verreth estimates its surface had been steadily shrinking between the 5th and 1st century BCE, the Roman era lake eventually becoming a saline bog southeast of Casium.²¹⁰ Due to the geological instability of the Sirbonitic sandbar, low-lying salt flats near Casium were prone to sporadic flooding. During his stay in Egypt (ca. 25–20 BCE), Strabo witnessed a remarkable event when the Mediterranean rose and turned Casium into an island:²¹¹

And when we were residing in Alexandria near Egypt, the sea about Pelousion and mount Kasion rose and flooded the country and made an island of the mountain, so that the road by the Kasion into Phoenicia became navigable [that is, flooded]. (Strabo, *Geography* 1.3.17, trans. Verreth)

Verreth contends that the deluge mentioned by Strabo might have begun to the west of Casium, the area I marked as Strabo's breach on Map 3. In Verreth's interpretation, the rolling wave would break into the swampy hollow between Gerra and Casium (the bed of the western arm of modern Lake Bardawil), overspill into the Sirbonitic Lake, break the Sirbonitic spit at Ekregma, and turn Casium into an island.²¹² I identify this hollow with ancient *Barathra of Pelusium* (the Pits), a swampy depression purported to lie somewhere between Casium and Pelusium,²¹³ a possible obstacle for caravans striking south from the coast.

The landscape provides intriguing hints for plotting Pliny's trail. First, Figueras draws our attention to Pliny's remark that the trail from Casium to Cleopatra began two miles beyond Mount Casius (*ultra Casium Montem*). Figueras surmises that a narrow inlet of the lake might have isolated Casium from its hinterland; consequently, travellers would have to cross it by a raft or a ferry.²¹⁴ Why the trail did not simply circumvent this hypothetical body of water along its western edge remains unknown. Possibly, the lake did not end near Casium, but simply shallowed into a boggy trough of *Barathra* towards Gerra. Travellers might have wanted to avoid the wetland and ferry across at its narrowest point to reach the higher ground south of Casium. Further south, the trail striking from Casium presumably converged with the old 'Way of Horus', where it turned west towards twin road stations of Qatia and Qasrawet, which

siphoned off inbound coastal traffic (section 4.3.3). Abundant in palm copses and waterholes, lands between Qatia and Qasrawet presumably constituted the heartland of the Autaei tribe mentioned by Pliny,²¹⁵ a convenient place for a watering stop along the road. Leaving Qatia, the trail probably skirted the northern edge of the dune field, following the older branch of the 'Way of Horus' to Sile, where it converged with tracks leading from Pelusium (section 4.4.1). Subsequently, both trails would continue south and end their run at the northern tip of the Gulf of Suez.

4.4.3. *Gerra–Cleopatris trail (Maps 3 and 4)*

The last track enumerated by Pliny ran through waterless mountains (*per [...] asperum montibus et inops aquarum*) and linked Cleopatris to Gerra; the shortest one, it was supposedly also the most taxing, and apparently, it did not converge with other trails,²¹⁶ although at some point, it must have crossed one striking from Casium.²¹⁷ Its exact run has never been determined.²¹⁸ Pau Figueras speculated the trail led from Gerra to the Nabataean trading post at Qasrawet and then followed a Nabataean trading route until the foothills of Gebel Maghara, where it would turn south, skirting the northwestern edge of the al-Tih plateau until it approached the Gulf of Suez.²¹⁹ Nevertheless, this proposal has several flaws. Figueras' conjectured trail meets Pliny's specification of ruggedness, but it is neither the shortest nor the driest crossing to Cleopatris.

Having examined the topography of the northern Sinai, I believe Figueras' conjecture can be improved to meet Pliny's two remaining specifications. The trail striking from Gerra would first turn towards Qatia and Qasrawet of the Autaei, but it would subsequently veer southwest and traverse the breadth of the dune field instead of edging past it. Such a route would be the most direct and yet the most strenuous one. In Strabo's words, this waterless passage opened only to resilient, sand-loving camels that could easily cross the sixty kilometres of sand that separate Qasrawet from the Gulf of Suez. What of Pliny's assertion that the road from Gerra passed through 'rugged mountains'? They need not have been mountains as one would normally understand it. Mount Casius, mentioned in the very same passage, is a steep sandy hillock, currently not even 40 metres high.²²⁰ Consequently, I believe Pliny's 'waterless mountains' were nothing more than high dunes the trail manoeuvred around on its way from Qasrawet to Cleopatris. Regrettably, shifting sands would have obliterated ancient caravan traces. Should there be any tracks left, future surveys to the northeast of Suez will hopefully uncover their remains.

4.5. Trails across the central and southern Sinai

In the Sinai interior, the desolate al-Tih Plateau stands as a formidable obstacle for caravan traffic between Egypt and Palestine. In contrast to the Mediterranean coastal zone in the north and crystalline mountains in the south, the arid central upland has little grazing ground and water; consequently, it yielded little evidence for pre-Islamic occupation. In the Pharaonic period, Egyptian prospectors might have crossed al-Tih

on their way to the tip of the Gulf of Aqaba. Their aim would be Timna near Elath/Aila, where, up to Ramesses V's reign, Egyptians intermittently drew profits from local mines, most probably run by local Qeni tribes.²²¹ Under Ramesses III, a trading expedition might have crossed Sinai on its way to Arabian oasis of Tayma, their route possibly marked with cartouches, but its exact trajectory remains unknown (section 4.5.1).²²² After the Greek conquest of Egypt, central Sinai remained a blank spot in archaeological records. It stands to reason that some kind of land connection existed between Cleopatra at the Gulf of Suez and Aila at the Gulf of Aqaba, but no Graeco-Roman remains surfaced at any sites in the central al-Tih.²²³ It was only in the Islamic period when al-Tih was directly traversed by Muslim pilgrims travelling to Mecca. Their route, at times called Darb al-Hagg or pilgrimage road, strikes directly east from Suez to Aqaba, running through Mitla Pass, An-Nakhl fortress and Themed.²²⁴ Stretching the evidence for Darb al-Hagg, some scholars have maintained that the track was walked in the Roman era.²²⁵ Today, it is believed that the Graeco-Roman-era traffic preferably detoured the inhospitable plateau from the south, wending its way through the sandstone interior of the southern Sinai, where water and shelter were easier to come by (section 4.5.2). In the Christian era, the southern bypass track became the choice pilgrimage route to sites clustered around St. Catharine's monastery.²²⁶

4.5.1. *The Cartouche Road of Ramesses III or Pharaonic trans-Sinai link (Map 7)*

In 2013, Somaglino and Tallet postulated that a New Kingdom trans-Sinai track marked with three similar Ramesses III cartouches, which I name the Cartouche Road,²²⁷ might have linked Egypt to incense-bearing Arabia. Forming a gentle southward curve, the track supposedly wound its way from the tip of the Gulf of Suez across the Suez Foreshore to Wadi Abu Gada,²²⁸ where it scaled the escarpment of al-Tih, struck across the plateau for copper mines of Themilat Radadi/Borot Roded²²⁹ near Timna, and arrived at Elath/Aila (then possibly known as Ezion Geber);²³⁰ from Elath, it would continue east through the Arabian Peninsula, to a Saudi Arabian oasis of Tayma and possibly beyond.²³¹

The evidence for the Cartouche Road remains inconclusive. Somaglino and Tallet hypothesise that the cartouches record Ramesses III's expedition to the incense lands of Arabia,²³² passing through [1] Wadi Abu Gada,²³³ [2] Themilat Radadi,²³⁴ and [3] Tayma. An important stop on Arabian spice trade routes, Tayma oasis was settled in the 3rd millennium BCE. Cuneiform documents dated to the 8th century BCE confirm the significant role Tayma played in Arabian spice trade; yet, a subset of scholars hypothesise that the oasis might have been a lively spice trade market already in 13th–12th centuries BCE,²³⁵ the early date tallying with Egyptian artefacts (Ramesside scaraboids and divine figurines) found in Tayma layers dated to the Late Bronze Age.²³⁶ However, the exact run of the hypothetical Cartouche Road has not been investigated: Somaglino and Tallet's trajectory does not consider the difficult nature of the terrain to be covered and has to remain a hypothesis until more data is brought to light.

In his 2017 article, Tallet proposed yet another trajectory across the southern Sinai, here called the Pharaonic trans-Sinai link. In his view, the Middle Kingdom donkey caravans from Suez to mines at Serabit al-Khadim did not march across the Suez Foreshore, but travelled towards Mitla Pass, turned south-east-south across al-Tih and descended from the plateau near Wadi Abu Gada gorge, where, relevantly, the first cartouche of Ramesses III was also found. Subsequently, caravaneers would turn southeast and arrive at the mining complex of Serabit al-Khadim, where they were joined by fellow miners arriving across the Red Sea.²³⁷ Another feeder trail might have linked Serabit al-Khadim to copper-rich lands near Timna in southern Palestine, via Feiran Oasis, Mount Sinai and Ain Hudra or via the Dividing Valleys separating al-Tih plateau from the Sinai massif. Tallet hypothesised that it was the route along which experienced Asiatic miners and workers (*Retenu*) came from copper mines and smelters of southern Negev to Serabit al-Khadim.²³⁸

Both Somaglino and Tallet's Cartouche Road and Tallet's Pharaonic trans-Sinai link cannot be plotted with any certainty, posing several interpretative problems. First, the putative New Kingdom Cartouche Road has been neither precisely charted nor surveyed, Somaglino and Tallet's trajectory simply connecting three dots without regard for the peculiarities of the arid and unforgiving landscape. Second, it remains unknown whether recorded New Kingdom expeditions to Timna and Tayma under Ramesses III followed Tallet's putative track via Feiran, went by yet another road through desolate al-Tih, or reached their destinations by sea. Third, given the barrenness of al-Tih and conspicuous absence of Egyptian material and sites in Sinai (besides Wadi Maghara/Serabit al-Khadim and Timna complexes),²³⁹ it appears to be the case that the Egyptians only rarely crossed central or southern Sinai on foot.²⁴⁰ Copper shipments from Timna, given the circuitousness of the land crossing, probably came to Egypt by sea. A land connection between Wadi Maghara and Timna, should it exist, was probably plied by local middlemen, across the Dividing Valleys or along the southern mountain track via Feiran.²⁴¹ Nevertheless, an extensive survey of al-Tih and Dividing Valleys is needed before such trails may be plotted with any certainty. Relevantly to this work, it appears that the Nabataean and Roman-era traffic in Sinai omitted al-Tih altogether.

4.5.2. The southern Sinai trail: Cleopatris/Clysma–Feiran–Mt. Sinai–Ain Hudera–Aila (Map 7)

HISTORY OF RESEARCH

Ancient and modern geographers claimed Cleopatris and Aila – two major Roman ports at the respective tips of Suez and Aqaba Gulfs – had been linked with a trans-Sinai road under the Roman administration; nevertheless, its exact run and locations of road stations have long remained a point of contention. Virtually all debate builds on a single ancient source, the 4th century *Peutinger Map* (*Tabula Peutingeriana*). The Map charts a road leading from Aila to Cleopatris, an elongated southward arc that passes under Mount Sinai. It also records two stations along the way, *Phara* and *Medeia*, and

gives distances between them. Many attempted to chart this trail on the modern map of Sinai. Disregarding the southward curve shown on the *Map*, Konrad Miller and his epigones drew an imaginary straight line between the road's two termini and assumed the Roman-era track closely followed the Islamic Darb al-Hagg. Consequently, Ball and Murray (1942) and Aharoni (1968) measured out specified distances along Darb al-Hagg and wrongly identified Phara with Themed and Medeia with Sudr al-Heitan, otherwise unremarkable and desolate locations.²⁴²

Table 4.6 Stations on the Aila-Cleopatris/Clysma road according to Tabula Peutingeriana

<i>Stations on the Aila-Cleopatris/Clysma road according to Tabula Peutingeriana</i>	<i>Distances in Roman miles</i>	<i>Identification by Ball-Murray-Aharoni (* = incorrect)</i>	<i>Actual distances between identified sites (in Roman miles)</i>
Haila-Phara	50	al-'Aqaba-Themed*	48
Phara-Medeia	80	Themed*-Sudr al-Heitan*	80
Medeia-Clisma	40	Sudr al-Heitan*-Qal'at al-Qulzum	44
IN TOTAL	170	IN TOTAL	172

It was only in 1970 when Beno Rothenberg's archaeological survey of the southern Sinai disproved once and for all the identification of Darb al-Hagg with the Roman Cleopatris-Aila road. Two facts became apparent. First, no Graeco-Roman remains surfaced at sites along Darb al-Hagg; second, surveyors uncovered a wealth of Nabataean, Greek, Latin, Hebrew, and Coptic inscriptions in the craggy southern Sinai, surmising this region was the corridor through which pre-Islamic travellers crossed from Egypt to Aila and vice versa.²⁴³ Having extensively surveyed the peninsula, Rothenberg charted the trail from Cleopatris to Aila in an extended southward arc: first south-east-south along the shore, then southeast into the mountain interior along Wadi Mukkateb, to Feiran oasis and Gebel Musa (Mount Sinai), then again north-east-north via Wadi Ghazala and Wadi Watir to Qa en-Naqb plateau, from where the track would steeply descend east, to the Gulf of Aqaba and Aila.²⁴⁴ As the proposed trajectory does not tally with distances provided by the *Table*, Mayerson downplays their importance in favour of archaeological evidence. The scholar argues, even if the copyist confused the station distances, he correctly charted the trail via Mount Sinai, which substantiates Rothenberg's identification.²⁴⁵

Significantly, Rothenberg saw this trail as a primarily Nabataean thoroughfare. The imperial traffic was of secondary importance at most and grew in volume only in the late Roman and Byzantine eras when the southern part of the peninsula became the home of anchoritic Christian communities.²⁴⁶ Indeed, it appears that, save the 'Way of Horus' and Sirbonitic roads in the north, most of the desert traffic in the Sinai in the investigated period was generated by the Nabataeans. It was only in the Byzantine period that Nabataean trails were trodden by inhabitants of the empire proper, most

Map 7 – Central and southern Sinai

In the Sinai interior, the desolate al-Tih Plateau stands as a formidable obstacle for caravan traffic between Egypt and Palestine. In contrast to the Mediterranean coastal zone in the north and crystalline mountains in the south, the arid central upland has little grazing ground and water; consequently, it has yielded little evidence for pre-Islamic occupation. It has been suggested that two weakly-attested Pharaonic roads (the *CARTOUCHE ROAD OF RAMESSES III* and the *PHARAONIC TRANS-SINAI LINK*) may have skirted the southern edge of al-Tih, linking Cleopatra (at the tip of the Suez Gulf) to Aila (at the tip of the Aqaba Gulf). However, these trajectories have been conjectured and no physical evidence has surfaced. Relevantly, no traces of Roman-era traffic have been uncovered in the al-Tih Plateau. There is firmer evidence for Roman-era desert trails in the Sinai Massif, linked to the Nabataean mining and smelting activities. Setting out from Petra, Nabataean mining expeditions followed a circuitous route through southern Sinai on their way to copper and turquoise lodes of Gebel Umm Rinna/Wadi Nasb. Workers at these sites received supplies from a permanent fortified Nabataean settlement at Feiran (*Pharan*) oasis (modern Tell al-Mekharet). No land trail initially linked Feiran to Egypt. Available archaeological data and surviving Christian itineraries imply (although they do not prove) that the section of the trail between Cleopatra and Feiran came into regular use only in the Byzantine era as pilgrims from Egypt flocked to visit Biblical sites and secluded mountain monasteries of Sinai. In the early Roman era, land traffic between Cleopatra and Feiran was minimal at best; the travellers between Egypt and Aila apparently preferred either to make a northern detour via Gaza or Qasrawet or sail for Aila from the Egyptian Red Sea ports of Myos Hormos and Berenike.

Maps and materials consulted: Rothenberg 1970, 8, fig. 2, 14, fig. 7–8, 18–19; Davies 1979, 77; Mayerson 1981, 167–176; 1982, 54–57; Tamari 1982; Graf 1998, 110–111; Barrington Atlas (ed. Talbert 2000), map 76; Tallet 2017, 193–198.

NABATAEAN TRAIL FROM PETRA TO MINES OF WADI NASB (section 4.5.2): Petra (not depicted) → Aqaba/Elath (*Aila/Ailana*) → Wadi Tuweiba → Bir al-Heisi → Wadi Watir → Bir as-Sawra → Ain al-Furtaga → Ain Hudera → Wadi Haggag → Wadi Marra → Gebel Musa/St. Catherine (*Mons Sinai/Mons Horeb*) → Feiran Oasis (*Pharan*) → Wadi Mukkateb → Wadi Sidri → Wadi Nasb → Gebel Umm Rinna → Serabit al-Khadim

LATE ROMAN/BYZANTINE TRAIL FROM CLEOPATRA TO MT. SINAI (AND AILA?) (section 4.5.2): Suez (*Cleopatra*) → Ain Musa → Wadi Sudr (*Medeia?*) → Wadi Gharandal (*Surandela/Arandara?*) → Wadi Sidri → Wadi Mukkateb → Wadi Feiran → Tell al-Mekharet/Feiran Oasis (*Pharan*) Gebel Musa/St. Catherine (*Mons Sinai/Mons Horeb*) → [possible extension to Palestine: Wadi Marra → Wadi Haggag → Ain Hudera → Ain al-Furtaga → Bir as-Sawra → Wadi Watir → Bir al-Heisi → Wadi Tuweiba → Aqaba/Elath (*Aila/Ailana*)]

PHARAONIC TRANS-SINAI LINK (UNCONFIRMED) (section 4.5.1): Suez (*Cleopatra*) → Mitla Pass → al-Tih Plateau → Wadi Abu Gada → Tell Ras Budran → Wadi Nasb → Gebel Umm Rinna → Serabit al-Khadim → [further run conjectured, possible extension to Timna depicted]

DARB AL-HAGG (ISLAMIC) (section 4.5): Suez (*Cleopatra*) → Mitla Pass → al-Tih Plateau → An-Nakhl → Themed → Wadi Umm Sideira → Aqaba/Elath (*Aila/Ailana*) → [eastwards to Mecca]

of them pilgrims travelling to and from Egypt, Jerusalem and Mount Sinai. Some of them, like Egeria (late 4th–early 5th century CE) or Antoninus of Piacenza (ca. 570 CE), left written accounts of their journeys that allow us to chart their itineraries through the peninsula.²⁴⁷

THE RUN OF THE TRAIL

The run of the trail between Cleopatris and Aila can be divided in two distinct sections (Cleopatris → Feiran and Feiran → Aila), respectively discussed by Mayerson and Rothenberg. Setting out from Cleopatris/Clysma at the tip of the Gulf of Suez, the trail to Aila struck south-east-south and negotiated the barren, desolate coastal plain of Eastern Sinai, periodically crossing wide mouths of wadis emptying into the Gulf of Suez.²⁴⁸ At this stretch of the road, travellers rested by brackish watering holes. The first one, Ain Musa, is found about 12 kilometres from Suez;²⁴⁹ about 30 kilometres to the south, one finds another at the mouth of Wadi Sudr, tentatively identified by Mayerson with Medeia.²⁵⁰ 40 kilometres to the south-east-south, yet another spring bubbles near the mouth of Wadi Gharandal, possibly the location of ancient Surandela/Arandara, a fortified Byzantine monastic community mentioned by Antoninus of Piacenza.²⁵¹

Further south, the trail continued to follow the coast for about 50 kilometres and probably bifurcated in the vicinity of modern settlements of Abu Zenima and Abu Rudeis. The main track struck southeast and ascended into the rugged interior through gorges of Wadi Sidri and Wadi Mukkateb, their walls carved with scores of Nabataean, Greek, Hebrew, and Byzantine inscriptions and their beds strewn with poorly identified Romano-Byzantine pottery.²⁵² In contrast, a side branch meandered northeast via Wadi Nasb and linked the coastal trail to a complex of turquoise and copper mining sites at Gebel Umm Rinna/Wadi Nasb, operated in Egyptian (18th–15th century BCE) and (post-)Nabataean periods. Under the Egyptians, the region primarily yielded turquoise, whereas copper mining and smelting began in earnest under the Nabataeans;²⁵³ the smelters of Wadi Nasb remained active in the Romano-Byzantine period, with neighbouring areas abounding in both Nabataean and Greek inscriptions, pottery, and tell-tale slag heaps.²⁵⁴

Following the bed of Wadi Mukkateb for about 30 kilometres, the winding track eventually reached a large and well-watered Feiran (*Pharan*) oasis, where a permanent fortified Nabataean settlement was uncovered at Tell al-Mekharet.²⁵⁵ After surveying the area of Feiran, Rothenberg inferred that Tell al-Mekharet was not a commercial trading station on the Egypt-Aila road but a Petra-oriented logistic centre for Nabataean turquoise and copper mining operations in neighbouring Wadi Maghara and Wadi Nasb.²⁵⁶ Available archaeological data and surviving Christian itineraries imply (although not prove) that the section of the trail between Cleopatris and Feiran came into regular use only in the Byzantine era;²⁵⁷ before that point, Nabataeans had little incentive to walk the trail to Cleopatris, since they plied better and shorter roads to Egypt in the northern Sinai (see section 4.3). After the Christian settlement

of Sinai, a populous Byzantine city was built on top of the erstwhile Nabataean town, now a waystation for those on their way to Mount Sinai or Egypt.²⁵⁸

Leaving Feiran, the track continued southeast until Mount Sinai (Gebel Musa), which in the discussed period did not have permanent occupation centres, its iconic monastery constructed only in the 6th century CE.²⁵⁹ Here, the trail turned northeast along the beds of Wadi Marra and Wadi Haggag, both ravines inscribed with a treasure trove of Nabataean, Greek, Latin, Hebrew, Arabic, and other carvings.²⁶⁰ Close to Wadi Haggag (Wadi of Pilgrims) one finds a picturesque palm oasis of Ain Hudera, its spring nestled among white sandstone hills and dune sheets. An ancient burial ground and camping site, the oasis produced Nabataean and Romano-Byzantine pottery shards and inscriptions.²⁶¹ The engravings continue to appear on wadi walls as the trail followed Wadi Ghazala and reached Ain al-Furtaga, another perennial palm oasis;²⁶² from that point, the easy-going trail ran almost directly north via wide Wadi Watir to Bir al-Sawra well and then by Wadi al-Heisi to Bir al-Heisi well.²⁶³ Eventually, the trail ascended the elevated plain at the eastern edge of Sinai, Qa en-Naqb, where it forked.²⁶⁴ One arm continued north to join Darb al-Ghazza, passing on its way through Wadi Umm Sideira ravine, where one finds a natural pool of water and an abundance of inscriptions.²⁶⁵ Another arm probably swerved east and descended steeply into Wadi Tuweiba, where explorers found Nabataean masonry and unfinished rock-cut caverns, a Latin inscription by a soldier of the Third Legion of Cyrenaica, and a copper mine loosely dated to the Romano-Byzantine period.²⁶⁶ Wadi Tuweiba debouches into the Gulf of Aqaba near Pharaoh's Island (Gazirat Firaun); the trail then turns north and follows the coast to arrive in Aila not long afterwards.

As stated above, it is uncertain whether the Roman-era trail connected Cleopatris to Aila. Annexed by Romans in 106 CE, Aila was an important port and spice trade market;²⁶⁷ it stands to reason that it could have had some sort of land connection to Roman Egypt via Feiran. Nonetheless, the dearth of Nabataean- or Roman-era material on the trail between Cleopatris and Feiran directly challenges this assumption and implies the Nabataean trail between Aila and Feiran did not extend to Cleopatris.²⁶⁸ In direct contrast to the *Peutinger Map* (4th century CE), the slightly earlier *Antonine Itinerary* (late 2nd/early 3rd century CE) does not record any Aila–Clysma roads. Either the trail fell out of its geographical scope – the *Itinerary* being silent on the south Sinai trails – or, more probably, the trail saw no imperial traffic before the 4th century CE, expressly in relation to its Cleopatris–Feiran section. The Roman-era travellers leaving Aila for Egypt could reach their destination in other ways. They could have either made a detour via Gaza (section 4.3.1) and Qasrawet (section 4.3.3) or sailed to the Red Sea ports of Myos Hormos (section 5.2.4) and Berenike (section 5.2.5), a short and relatively inexpensive crossing due to northerlies prevailing in the region. We know of similar travel arrangements made by those travelling to Egypt from Leuke Kome, an Arabian port with roads linking it to Aila, Tayma, and Petra. During the abortive Roman military expedition to Arabia under Aelius Gallus (26/25 BCE), soldiers were shipped from Cleopatris to Leuke Kome, bypassing the Sinai interior;

the sea route was probably chosen in order not to overtax an army that still had to march through the inhospitable wastes of Arabia.²⁶⁹ In contrast, vessels sailing from Berenike or Myos Hormos northwards to Aila would have to tack against the Red Sea northerlies; it is possible that the traffic from Egypt to Aila preferred the longer land route by Qasrawet or Gaza. Likewise, miners and metallurgists at the Gebel Umm Rinna complex probably shipped copper and turquoise directly across the Red Sea, a better alternative than land transport through the barren central Sinai desert.

Notes

- 1 Negev and Schmitt-Korte 1983, 40–74, 85–87; Segal 1985, 317–328; Graf 1990, 45–75; Young 2001, 90–99, 113–115; Erickson-Gini and Israel 2003, 9–11; Erickson-Gini 2006, 2002.
- 2 For information on the Nabataean trade in the Negev and the Nabataeans in general see Hammond 1973; Negev 1977b, 520–686; Bowersock 1983, *passim*, 12–18, 60–61; Negev and Schmitt-Korte 1983, 40–76, 85–87, 153–167; Rubin 1996, 49–60; Young 2001, 90–91, 97–107; Erickson-Gini and Israel 2003, 9–11; Erickson-Gini 2007, 91–100.
- 3 Littmann and Meredith 1954, 1953; Starcky 1955; Rothenberg 1970, 14 (fig. 7), 18–19; Graf 1990, 64–67; Schmid 2007, 66; Sidebotham 2011, 154, 209–210.
- 4 Parker 1997, 21.
- 5 Greenwood 1997, 29.
- 6 Verreth 2006, 151.
- 7 Greenwood 1997, 29; Hoffmeier and Moshier 2013, 491.
- 8 Verreth 2006, 153–154.
- 9 Hoffmeier and Moshier 2013, 492–493. Pelusium had to be abandoned ca. 500 CE due to the Nile branch moving away from the city.
- 10 Hoffmeier and Moshier 2013, 491, 494.
- 11 Greenwood 1997, 29.
- 12 Greenwood 1997, 31–32.
- 13 Greenwood 1997, 29.
- 14 Greenwood 1997, 31–32.
- 15 Greenwood 1997, 30–31.
- 16 Mumford 2015, 1–6.
- 17 Greenwood 1997, 39–40.
- 18 Greenwood 1997, 45; Beit-Arieh 2003, 1–2.
- 19 Figueras 2000, 7–10; Verreth 2006, 590; Hoffmeier and Moshier 2013, 486.
- 20 Emphatically, it should not be identified with *the Way of the Sea* (Isa 8:32), which most probably denoted the Palestinian road from Dan to Tyre (Rainey 1981).
- 21 Figueras 2000, 5.
- 22 Valbelle 1994, 379–386. The erroneous use of the *Way of Horus* toponym has been pointed out to me by Filip Taterka, to whom I am grateful for his meticulous attention to detail.
- 23 Valbelle 1994, 380; Hoffmeier and Moshier 2013, 487.
- 24 Gardiner 1920; Bergoffen 1991; Hoffmeier and Moshier 2013, 487.
- 25 Gardiner 1920; Figueras 2000, 12; Hoffmeier and Moshier 2013, 495.
- 26 Gardiner 1920; Hoffmeier and Moshier 2013, 495–496.
- 27 Oren 2006, 280; 1993, 1387–1388; Hoffmeier and Moshier 2013, 496. For an exhaustive list of sites along the northern coast of Sinai and their possible identifications, see Verreth 2006, 158–412, 589–707.
- 28 Herodotus, *Histories* 3.5–10.

- 29 Herodotus, *Histories* 3.6–7; Verreth 2006, 359.
- 30 Figueras 2000, 95; two fortresses tentatively dated to that period have been found in Haruvim and Migdol.
- 31 For an incredibly detailed and thorough analysis of Egyptian, Ptolemaic, Roman, and Arabic sources on lake Sirbonis and its southern shore, see Verreth (2006, 128–138, 589–708).
- 32 Abd el-Maksoud 1998; Al-Ayeidi 2000, 53–61; Abd el-Maksoud and Valbelle 2011, 2005; Hoffmeier and Moshier 2013, 498–501.
- 33 Morris 2005, 5, 382–384, 404–409, 496; Hoffmeier and Moshier 2013, 488.
- 34 Figueras 2000, 6.
- 35 Figueras 2000, 162–163; Verreth 2006, 682–684.
- 36 Bir al-Nuss: Verreth 2006, 689. Gebel Lissan and al-Ghurabi: Verreth 2006, 692–693, 695–698.
- 37 Figueras 2000, 7; Verreth 2006, 831.
- 38 Verreth 2006, 641.
- 39 Clédat 1910, 234; Figueras 2000, 168; Verreth 2006, 632–637; Hoffmeier and Moshier 2013, 498.
- 40 Oren 1993, 1395; Verreth 2006, 609–611.
- 41 Diodorus, *Historical Library* 1.30.4–9, 16.46.5–6 (Artaxerxes III), 20.73.3 (Antigonos I); Verreth 2006, 123–125.
- 42 Figueras 2000, 238–244; Verreth 2006, 255–257, 266, 269–270.
- 43 Diodorus, *Historical Library* 1.60.4–10; Figueras 2000, 238–244; Verreth 2006, 255–257, 266, 269–270.
- 44 Tonneau 1926, 597; 1927, 93–95, pl. 2; Figueras 2000, 101, 243; Verreth 2006, 258, 280, 302–304, 316.
- 45 Strabo, *Geography* 16.4.24; Verreth 2006, 258.
- 46 Petrie 1937; Abel 1939, 540–541; Verreth 2006, 173, 225–227, 233–234.
- 47 Schmitt 1995, 115; Verreth 2006, 234–236.
- 48 *P.Ryl.* IV 627.235–236, 628.10–11, 638.22–23; Roberts and Turner 1952, 123–126; Figueras 2000, 45–46, 172–173, 228; Matthews 2006; Verreth 2006, 62–65, 191–198; Choat 2009, 41–75.
- 49 Schmitt 1995, 115; Abel 1939, 539–541; Verreth 2006, 181–182, 236–239, 244–245.
- 50 Figueras 2000, 232–237.
- 51 Figueras 2000, 12–13; Oren 2006, 279–292; Verreth 2006, 158; Hoffmeier and Moshier 2013, 498–506.
- 52 Figueras 2000, 8.
- 53 Arrian, *The Anabasis of Alexander* 3.1.1; Quintus Curtius Rufus, *Histories of Alexander the Great* 4.7.2–3; Figueras 2000, 9–10.
- 54 Verreth 2006, 116.
- 55 Verreth 2006, 115–117; Hoffmeier and Moshier 2013, 486–487, 494. Notably, the Sirbonitic spit was not a continuous landform until just before the Persian period. Due to global warming, it can be expected that rising waters of the Mediterranean will at some point once again submerge the sandbar.
- 56 In the Roman period, the lake stretched only between Casium and Ostracine, its western part (between Gerra and Casium) remaining either a dry hollow or a narrow ribbon of swamps; accordingly, the Roman-era sandspit measured only about 45 kilometres.
- 57 Figueras 2000, 9; Verreth 2006, 110–117.
- 58 Plutarch, *Parallel Lives, Mark Anthony* 3.3; Figueras 2000, 9; Hoffmeier and Moshier 2013, 486–487.
- 59 Strabo, *Geography* 1.2.4., 16.2.32; Figueras 2000, 180–181; Verreth 2006, 111.
- 60 Strabo, *Geography* 1.3.17; Verreth 2006, 465–466. According to Strabo (16.2.26), ‘in the neighbourhood of the Kasion situated near Egypt, [...] the land undergoes a single quick convulsion, and makes a sudden change to a higher or lower level, the result being that, whereas the elevated part repels the sea and the sunken part receives it, yet, the land makes reverse change and the site resumes its old position again, a complete interchange of levels sometimes having taken place and sometimes not.’

- 61 Diodorus, *Historical Library*, 1.30.4–9, 15.43.4–5, 20.73.3; Verreth 2006, 106–117.
- 62 Verreth 2006, 109–110, 138.
- 63 Neev and Friedman 1978, 427–429; Oren and Figueras 1982, 25; Verreth 2006, 109, 138–139.
- 64 Strabo, *Geography* 16.2.33; Verreth 2006, 55.
- 65 Pliny the Elder, *The Natural History* 5.14.68; Strabo, *Geography* 16.2.33; Verreth 2006, 512, 563–567, 1011.
- 66 *P.Ryl.* IV 627.230–231, 628.5–6, 630*.482–490; Claudius Ptolemy, *Geography* 4.5.5; Pliny the Elder, *The Natural History* 6.33.166–167; Strabo, *Geography* 1.3.4, 16.2.33; Clédât 1905; 1909; Oren 1993, 1394–1396; Figueras 2000, 19, 81, 191–195; Verreth 2006, 534–556, 575–585.
- 67 Verreth 2006, 114–117.
- 68 Hierocles 727.4 (Honigsmann 1939, 46); Noordegraaf 1938, 274; Figueras 2000, 162–163; Verreth 2006, 522–529, 523 n. 2170, 1003–105.
- 69 It first appears in *Itinerarium provinciarum Antonini Augusti* 152 (see below).
- 70 Hierocles, *Synecdemos* 727.3 (Honigsmann 1939, 46); *P.Ryl.* IV 627.230–232, 628.5–7, 630*.482–485; Noordegraaf 1938, 274; Abel 1940, 233; Oren 1993, 1394–1396; 1998, 81; Graf 1998, 109; Figueras 2000, 227–228; Verreth 2006, 513–522.
- 71 Herodotus, *Histories* 2.6.2, 2.158.4, 23.5.2–3; Clédât 1910, 209–219; 1923, 83–84; Dothan 1967, 279–280; Oren 1993, 1394–1396; 1998, 78; Figueras 2000, 174–178; Verreth 2006, 413–492, 501–510.
- 72 Clédât 1910, 209–219; 1923, 83–84; Dothan 1967, 279–280; Oren 1993, 1394–1396; 1998, 78.
- 73 Lucanus, *On the Civil War* 8.858; Verreth 2006, 413, 434–439, 441–459.
- 74 Verreth 2006, 511.
- 75 Strabo, *Geography* 1.4.7, 16.2.32 (τὸ δ' Ἐκρηγμα συγκέχλωσται); Diodorus, *Historical Library* 19.64.8; Verreth 2006, 110–111, 116–117.
- 76 Verreth 2006, 115–117.
- 77 Oren 1993, 1394–1396; Figueras 2000, 207–213; Verreth 2006, 350–377, 389–396.
- 78 Claudius Ptolemy, *Geography* 4.5.6 (Müller 1901 I2, 682, Ball 1942, 105); Josephus, *The Jewish War* 4.11.5 (661), Pseudo-Hegesippos, *History* 4.33.3 (Ussani 1932, 292); Martianus Capella, *On the Marriage of Philology and Mercury* 6.679 (Willis 1983, 241); Solinus, *Collection of Curiosities* 34.1 (Mommsen 1895, 153); Pliny the Elder, *The Natural History* 5.14.68; Krinagoras, *Anthologia Palatina* 7.645 (Beckby 1965 II, 378, 621); Verreth 2006, 351–353, 361–365, 371–377.
- 79 Hölscher 1903, 56; Verreth 2006, 115, 140–141, 352, 362–363, 371–372; [for Ostracine as a waterless place:] Krinagoras, *Anthologia Palatina* 7.645 (Beckby 1965 II, 378, 621); Josephus, *The Jewish War* 4.11.5 (661), Pseudo-Hegesippos, *History* 4.33.3 (Ussani 1932, 292); [for grapes and cucumbers grown there:] *P.Ryl.* 630*.470–476.
- 80 Verreth 2006, 115, 140–141, 352.
- 81 Clédât 1910, 220; Verreth 2006, 390–393.
- 82 Roberts and Turner 1952, 123–126; Figueras 2000, 45–46; Matthews 2006; Choat 2009, 41–75.
- 83 Ball 1942, 140; Figueras 2000, 48.
- 84 Ball 1942, 154; Figueras 2000, 46.
- 85 Woolley and Lawrence 1914, 39–44; Davies 1979, 77; Cohen 1979, 62; Hoffmeier and Moshier 2013, 485–486.
- 86 Somaglino and Tallet 2013, 514.
- 87 Morris 2005, 496; Rzepka *et al.* 2009; 2010; Hoffmeier and Moshier 2013, 485; Somaglino and Tallet 2013, 513–514.
- 88 Kitchen 1998; Hoffmeier and Moshier 2013, 485.
- 89 Figueras 2000, 24–25.
- 90 Clédât 1924, 34–36; Aharoni 1967, 51–52; Cohen 1979, 62; Davies 1979, 82; Meshel 1994, 39; Hoffmeier 2005, 160–161.
- 91 Woolley and Lawrence 1914, 39–44; Aharoni 1967, 51–52; Davies 1979, 82; Hoffmeier 2005, 160–161; 2006, 1; Erickson-Gini, personal communication.

- 92 Woolley and Lawrence 1914, 39–44; Aharoni 1967, 51–52; Cohen 1979, 62; Davies 1979, 82; Hoffmeier 2005, 160–161; Erickson-Gini, personal communication.
- 93 Erickson-Gini, personal communication.
- 94 For accounts on the Nabataean trade in the Negev and the Nabataeans in general see Hammond (1973); Negev (1977b, 520–686); Negev and Schmitt-Korte (1983, 40–76, 85–87, 153–167); Bowersock (1983, *passim*, 12–18, 60–61); Rubin (1996, 49–60); Young (2001, 90–91, 97–107); Erickson-Gini and Israel (2003, 9–11); Erickson-Gini (2007, 91–100).
- 95 Diodorus, *Historical Library* 19.94.4–5; Young 2001, 90–94, 97–100, 106–107, 113–115; Erickson-Gini and Israel 2013.
- 96 Negev and Schmitt-Korte 1983, 40–74, 85–87; Segal 1985, 317–328; Graf 1990, 45–75; Young 2001, 90–99, 113–115; Erickson-Gini and Israel 2003, 9–11; Erickson-Gini 2002; 2006.
- 97 Littmann and Meredith 1953; 1954; Starcky 1955; Rothenberg 1970, 14 (fig. 7), 18–19; Graf 1990, 64–67; Schmid 2007, 66; Sidebotham 2011, 154, 209–210.
- 98 Negev 1966, 89–98; Ben-David 2012, 17–26.
- 99 Ben-David 2012, 17–26; Erickson-Gini and Israel 2013, 24–29, 39–49.
- 100 Erickson-Gini and Israel 2003, 25; Erickson-Gini 2014, 101.
- 101 Figueras 2000, 24; Gentry 2017, 25–26.
- 102 Josephus, *Jewish Antiquities* 13.13.2, 14.1.4; Erickson-Gini and Israel 2003, 25.
- 103 Erickson-Gini and Israel 2013, 26–28.
- 104 Negev 1966, 89–98; Meshel and Tsafrir 1975, 15; Bowersock 1996, 164–186.
- 105 Cohen 1982c, 240–247.
- 106 Erickson-Gini and Israel 2013, 28–29.
- 107 Erickson-Gini 2007, 7; Ben-David 2012, 17–26; Erickson-Gini and Israel 2013, 24–29, 39–49.
- 108 Erickson-Gini 2006, 165; Erickson-Gini and Israel 2013, 41.
- 109 Josephus, *The Jewish War* 1.4.2, 1.14.2, *Jewish Antiquities* 13.13.3; Erickson-Gini and Israel 2003, 25, 39; Erickson-Gini 2014, 101.
- 110 Strabo, *Geography* 16.4.24; Verreth 2006, 258; Sidebotham 2011, 177.
- 111 Figueras 2000, 24, 101, 243; Verreth 2006, 280.
- 112 Gentry 2017, 25–26.
- 113 Josephus, *Jewish Antiquities* 14.1.4; Erickson-Gini and Israel 2013, 25, 39.
- 114 Josephus, *The Jewish War* 1.4.2, 1.14.2, *Jewish Antiquities* 13.13.3; Abel 1938, II, 138; Figueras 2000, 101; Verreth 2006, 259, 280.
- 115 Oren 1982, 203–207; Arthur and Oren 1998, 197; Meshel 2000, 3–17, 105–106; Verreth 2006, 663–665.
- 116 Pliny the Elder, *The Natural History* 12.63–65.
- 117 Clédat 1910, 234–237; 1912, 145–168; 1916, 9; Oren 1982, 203–211; Gawlikowski 2003, 195–199; Verreth 2006, 644, 662.
- 118 Clédat 1916, 9; Verreth 2006, 644.
- 119 Figueras 2000, 7.
- 120 Paoletti 1903, 104; Clédat 1909, 765–766, 769; Verreth 2006, 646–647.
- 121 Verreth 2006, 647.
- 122 Clédat 1910, 234–237; 1912, 145–168; Oren 1982, 203–211; Gawlikowski 2003, 195–199; Verreth 2006, 662.
- 123 Oren 1982, 203–207; Verreth 2006, 663–665; *contra* Clédat (1912, 146), who pushes the settlement date to the 1st century CE.
- 124 Oren 1982, 203–207; Verreth 2006, 663–665.
- 125 Oren 1982, 208; Verreth 2006, 662–665.
- 126 The 2nd/3rd century CE abandonment date is supported by Oren (1982, 206–208), Arthur and Oren (1998, 194), and Verreth (2006, 665). Conversely, Figueras (2000, 229–230) argues for an early 2nd century CE terminus, linking Qasrawet's decline to a slump in desert trade after

- the Roman annexation of Nabataea (106 CE); even so, Nabataean temples at Qasrawet show signs of use at least until the late 2nd century CE.
- 127 Clédat 1910, 236; 1912, 146–147; Oren 1982, 209–211; Arthur and Oren 1998, 195, 199; Verreth 2006, 670.
 - 128 Verreth 2006, 671–674.
 - 129 Clédat, 1912, 146, 148, 157; Littmann and Meredith 1954, 230–232; Starcky 1955, 153–156; Strugnell 1959, 34–35; Figueras 2000, 123–125; Verreth 2006.
 - 130 Starcky 1955, 156; Strugnell 1959, 33–35; Tsafirir 1982, 212; Verreth 2006, 671–674.
 - 131 Pliny the Elder, *The Natural History* 6.166–167. Verreth (2006, 673, n. 2910) notes that Tsafirir (1982, 212–214) spuriously (and ungrammatically) reconstructs the ancient name of Qasrawet as ‘*Castrum Autaei*’ or Κάστρον Αὐταῖοι (sic).
 - 132 Tsafirir 1982, 212–214; Verreth 2006, 672.
 - 133 Tsafirir, 1982, 212–214; Graf 1990, 65; Verreth 2006, 672, 675–678.
 - 134 Figueras 2000, 20.
 - 135 Clédat 1916, 9.
 - 136 For Pelusium–Petra road passing via Qasrawet, see Clédat 1924, 34–36, 1916, 9; Abel 1940, 62, n. 4; Strugnell 1959, 35; Tsafirir 1982, 212; Oren 1982, 208–209; Figueras 2000, 14; Verreth 2006, 662.
 - 137 Clédat 1916, 9; 1924, 34–36; Abel 1940, 62, n. 4; Strugnell 1959, 35; Figueras 2000, 20; Meshel 2000, 105–106, fig. 6–7.
 - 138 Arthur and Oren 1998, 197.
 - 139 Eliezer Oren, personal communication.
 - 140 Meshel 2000, 105, fig. 6.
 - 141 Figueras 2000, 20.
 - 142 Meshel 2000, 16.
 - 143 Erickson-Gini and Israel 2013, 39.
 - 144 Meshel 2000, 99.
 - 145 Meshel 2000, 100–112; Erickson-Gini and Israel 2003, 12.
 - 146 Meshel 2000, 99.
 - 147 Meshel 1981, 358–371.
 - 148 Meshel 2000, 106.
 - 149 Meshel 1994, 39–67.
 - 150 Meshel 2000, 3–17, 106.
 - 151 Meshel 2000, 16, 103.
 - 152 de Geus 1977, 60; Meshel 1994, 39, 103–104.
 - 153 Meshel 2000, 99.
 - 154 Trumbull 1885, 123–129; Dothan 1965; Ariei and Gophna 1976; Bruins 1986, 110–117; Cohen *et al.* 2007 (non vidi); Finkelstein 2013, 11–125.
 - 155 Meshel 2000, 104–106.
 - 156 Meshel 2000, 100, fig. 1. For more information on Har Karkom worship site, see Anati 2001 (with reservations).
 - 157 Meshel 2000, 105, fig. 6.
 - 158 Woolley and Lawrence 1914, 14–15; Frank 1934, 231–232; Smith 2010, 32–34; Darby and Darby 2015, 461–470.
 - 159 Meshel 2000, 110–112.
 - 160 Palmer 1871, 347–348; Meshel 2000, 110.
 - 161 Meshel 2013, 3–10.
 - 162 Meshel 1978, 50.
 - 163 Hadley 1993, 115.

- 164 Meshel 2000, 105, fig. 6, 100, fig. 1.
- 165 Meshel 2000, 110–112.
- 166 Meshel 2000, 105, fig. 6, 100, fig. 1.
- 167 Isaac 2017, 340.
- 168 Cuntz 1929, 23; Dilke 1985, 112–120; Talbert 2010; Sidebotham 2011, 157–158.
- 169 Schmitt 1995, 18–21.
- 170 Miller 1916, 833–834.
- 171 Schmitt 1995, 37, 232–233.
- 172 Aharoni 1954, 9–10, 16; Schmitt 1995, 177.
- 173 Miller 1916, 833–834.
- 174 Schmitt 1995, 232–233.
- 175 Alt 1935, 53–58; Schmitt 1995, 232–233, 241–242; Ben-David 2007, 106–107. Having surveyed the Arabah, Smith (2010, 95–96) and Alt (1935, 53–54) postulate that a road ran lengthwise along its western flank.
- 176 Frank 1934, 232–233, 239–240; Meshel 1989, 229, n. 6.
- 177 Roll and Avner 2008, 274–276.
- 178 Aharoni 1954, 10–11.
- 179 Schmitt 1995, 233.
- 180 Palmer 1871, 347–348; Abel 1938, 227; Aharoni 1954, 10; Avi-Yonah 1976, 76; Schmitt 1995, 233.
- 181 Avi-Yonah 1976, 63.
- 182 Schmitt 1995, 178.
- 183 For Yotvata as Ad Dianam: Frank 1934, 232–233, 239–240; Meshel 1989, 229, n. 6; against Yotvata as Ad Dianam: Smith 2010, 30–32; Isaac 2015, 45; 2017, 340–341.
- 184 Schmitt 1995, 233; Palmer 1871, 356, *contra* Aharoni (1954, 14 n. 13).
- 185 Schmitt 1995, 233.
- 186 Meshel and Tsafirir 1975, 9–16; Schmitt 1995, 233.
- 187 Schmitt 1995, 233.
- 188 Musil 1907, 241; Aharoni 1954, 14; Erickson-Gini and Israel 2003, 12.
- 189 Aharoni 1954, 14–16.
- 190 Musil 1907, 241–243; Frank 1934, 268–269; Aharoni 1954, 14.
- 191 Frank 1934, 263–265; Aharoni 1954, 14.
- 192 Aharoni 1954, 12–14.
- 193 However, Meshel and Tsafirir (1975, 19–20) did voice their reservations.
- 194 Meshel 2000, 110.
- 195 Herodotus, *Histories* 2.158; Shea 1977, 31–38; Figueras 2000, 17; Cohen 2006, 308–309; Cooper 2009, 195–209. The eastern branch of the canal originally emptied into the Nile near Bubastis (Late Egyptian–Ptolemaic eras) and was subsequently extended to Memphis/Cairo (Roman–Early Arabic eras) (Cooper 2009).
- 196 Strabo, *Geography* 16.4.23, 17.1.25–26; Cohen 2006, 308–309.
- 197 Pliny the Elder, *The Natural History* 6.167; Diodorus, *Historical Library* 1.33.12; Strabo, *Geography* 16.4.23–24, 17.1.25–26; Cohen 2006, 308–309.
- 198 Strabo, *Geography* 16.4.23, 17.1.25–26; Cohen 2006, 327–329; Sidebotham 2011, 199.
- 199 Claudius Ptolemy, *Geography* 4.5.14; Bruyère 1966, 50–51, 89–90; Sidebotham 1986, 49, 57; Mayerson 1996, 119, n.2; Cohen 2006, 327; the orthogonal foundation was excavated by Bruyère, with Mayerson and Sidebotham arguing that Bruyère’s finds were probably not Clysma, but what was left of Arsinoe.
- 200 Pliny the Elder, *The Natural History* 6.167; Herodotus, *Histories* 2.158. It appears that the canal was opened only during the Nile flood. Based on available pieces of evidence, Cooper (2009, 204–206) infers that the canal ran water between September and December, sporadically operating until January.

- 201 Strabo, *Geography* 16.2.30, 17.1.25; Figueras 2000, 19.
- 202 Herodotus, *Histories* 2.158.
- 203 Pliny the Elder, *The Natural History* 6.167.
- 204 Tsafirir 1982, 213–214; Figueras 2000, 17–19.
- 205 Verreth (2006, 10) corroborates that the modern Suez Canal was abutted on the east by an ancient trail.
- 206 Pliny the Elder, *The Natural History* 6.167; Herodotus, *Histories* 2.158.
- 207 For a detailed account on Casium's history, topography and archaeological finds in its vicinity, see Verreth (2006, 146–150, 413–498, 501–510).
- 208 Verreth 2006, 413. Surveys in the region point to the site being visited from at 6th century BCE onwards.
- 209 Verreth 2006, 414.
- 210 Verreth 2006, 10, 109–115.
- 211 Verreth 2006, 465
- 212 Verreth 2006, 125–126, 128–129.
- 213 Cf Verreth 2006, 117–118, 117, n. 24, 125–126. Strabo's passages attributed to Eratosthenes (1.3.4, 16.1.2) mention 'bogs about Pelusium' that might have been an obstacle for those wishing to travel inland.
- 214 Figueras 2000, 18–19.
- 215 Verreth 2006, 677. These two sites are described in greater detail in section 4.3.3.
- 216 Pliny the Elder, *The Natural History* 6.166–167; Ball 1942, 82.
- 217 Figueras 2000, 19.
- 218 Verreth 2006, 542–544.
- 219 Figueras 2000, 18–20.
- 220 Verreth 2006, 413–414. Its height might have varied across the ages; nonetheless, Verreth estimates that Mount Casius was never more than 100 metres high.
- 221 Rothenberg 1988; Somaglino and Tallet 2013, 516; Avner 2014. However, scarcity of Egyptian material in Sinaitic pottery assemblages led Mumford to believe that the Egyptians rarely travelled to Timna; instead, they had the local miners ship them a pre-arranged amount of copper (Mumford 2015, 5).
- 222 Somaglino and Tallet 2013.
- 223 Rothenberg 1970, 13; Mayerson 1982, 53–54.
- 224 Davies 1979, 77; Tamari 1982.
- 225 Ball 1942, 140.
- 226 Mayerson 1982, 54–55.
- 227 Somaglino and Tallet 2013, 517.
- 228 Tallet 2003; Somaglino and Tallet 2013, 512; Avner 2014, 139.
- 229 Avner 1972; Somaglino and Tallet 2013, 513; Avner 2014, 139; Mumford 2015, 10.
- 230 Cohen 2006, 314–315.
- 231 Sperveslage and Eichmann 2012; Somaglino and Tallet 2013, 517.
- 232 Somaglino and Tallet 2013, 514; Mumford 2017, 43.
- 233 Somaglino and Tallet 2013; Mumford 2017, 43.
- 234 Avner 1972; Mumford 2017, 43.
- 235 Maigret 2003; Demange 2010; Somaglino and Tallet 2013, 515–516.
- 236 Hausleiter 2010; Somaglino and Tallet 2013, 516.
- 237 Tallet 2017, 193–198.
- 238 Tallet 2017, 193–194, fig. 7.
- 239 Rothenberg 1970, 15–19.

- 240 Tallet 2017, 193–198. Gregory Mumford (personal communication) states that he saw some material in al-Tih which he very tentatively identified as Pharaonic Egyptian, but much more work is needed before this identification can be confirmed.
- 241 Avner 2014, 139; Mumford 2017, 43.
- 242 Miller 1916, 813–814; Ball 1942, 140, 157; Aharoni 1968, 52, n. 30; Mayerson 1981, 167–170.
- 243 Rothenberg 1970, 18–19; Mayerson 1982, 54–57.
- 244 Rothenberg 1970, 18–19.
- 245 Mayerson 1981, 167–174.
- 246 Rothenberg 1970, 19; Hershkovitz 1988, 47–49.
- 247 Mayerson 1981, 170–172.
- 248 Mayerson 1982, 54.
- 249 Mayerson 1982, 56.
- 250 Mayerson 1981, 173.
- 251 Mayerson 1981, 172; 1982, 54.
- 252 Rothenberg 1970, 21, 26, 29; Mayerson 1982, 54.
- 253 Rothenberg 1970, 15–18.
- 254 Gebel Umm Rinna: Rothenberg 1970, 15–18; Bir Nasb/Wadi Nasb/Wadi Umm Zerdab: Rothenberg 1970, 25.
- 255 Claudius Ptolemy, *Geography* 5.16.1; Rothenberg 1970, 20–21; Mayerson 1982, 47, 56.
- 256 Rothenberg 1970, 20–21.
- 257 Rothenberg 1970, 20–21.
- 258 Mayerson 1981, 170–172; 1982, 46–47, 56; Rothenberg 1970, 20–21, 26.
- 259 Mayerson 1981, 171.
- 260 Rothenberg 1970, 18–19, 28; Negev 1977a; 1981; Mayerson 1981, 174; 1982, 56.
- 261 Rothenberg 1970, 18, 28; Mayerson 1982, 56.
- 262 Rothenberg 1970, 18; Mayerson 1982, 56.
- 263 Rothenberg 1970, 18; Mayerson 1982, 56.
- 264 Mayerson 1982, 56.
- 265 Rothenberg 1970, 23; Mayerson 1982, 56.
- 266 Frank 1934, 247, T. 2–3; Rothenberg 1970, 5–9, 23.
- 267 Claudius Ptolemy, *Geography* 5.16.1; Pliny the Elder, *The Natural History* 5.12.65; Strabo, *Geography* 16.2.30, 16.4.18; Cohen 2006, 314–315; Sidebotham 2011, 199.
- 268 I admit this claim could be classified as *argumentum ex silentio*: the western seaboard of Sinai between Cleopatra and Pharan lacks stone surfaces on which travelers could leave their inscriptions.
- 269 Cassius Dio, *Roman History* 53.29.3–8; Pliny the Elder, *The Natural History* 6.32.160; Strabo, *Geography* 16.4.22–24; Sidebotham 2011, 198.

Roads of the Eastern Desert

The rugged, mountainous Eastern Desert stretches between the Nile Valley in the west and the Red Sea in the east, with the adjoining Sinai Peninsula separated by the narrow Gulf of Suez. Atbai Mountains soar in the central and eastern part of the desert, tumbling down to the Red Sea coastal plain; in the west, the mountains fall to the rolling expanse of hilly plateaus that eventually meet the edge of the Nile Valley.¹ Ancient Egyptians have walked the Eastern Desert since times immemorial, its main attracting factors being substantial mineral resources to be exploited and exotic goods to be imported via the Red Sea ports.

Travellers in the Eastern Desert would find certain features of this area facilitate their crossings. Due to its high elevation and specific geological make-up, the Eastern Desert attracts and stores somewhat more water than its western neighbour. Groundwater is often found at a shallow depth and can be withdrawn by digging makeshift wells in the wadi beds.² Unsurprisingly, traffic in the Eastern Desert tends to follow dry beds of rivers that once flowed from the chain of peaks in the centre to the Red Sea or the Nile Valley. Ancient trails crossed the desert from west to east, navigating well-watered wadi beds where wells and waterholes could be found at intervals sufficient to ensure proper watering of beasts of burden.

5.1. Roads of the Eastern Desert – northern section

The exceedingly dry area in the northern part of the Eastern Desert, probably, was somewhat wetter in the Antiquity and thus more conducive to human activities in the desert.³ For practical purposes of my analysis, the northern part of the Eastern Desert may be further subdivided into two parts. The northern subsection, situated between modern towns of Helouan and Ain Soukhna in the north and Wadi Araba in the south, was a hotspot of Pharaonic mining activity but was not often visited in the

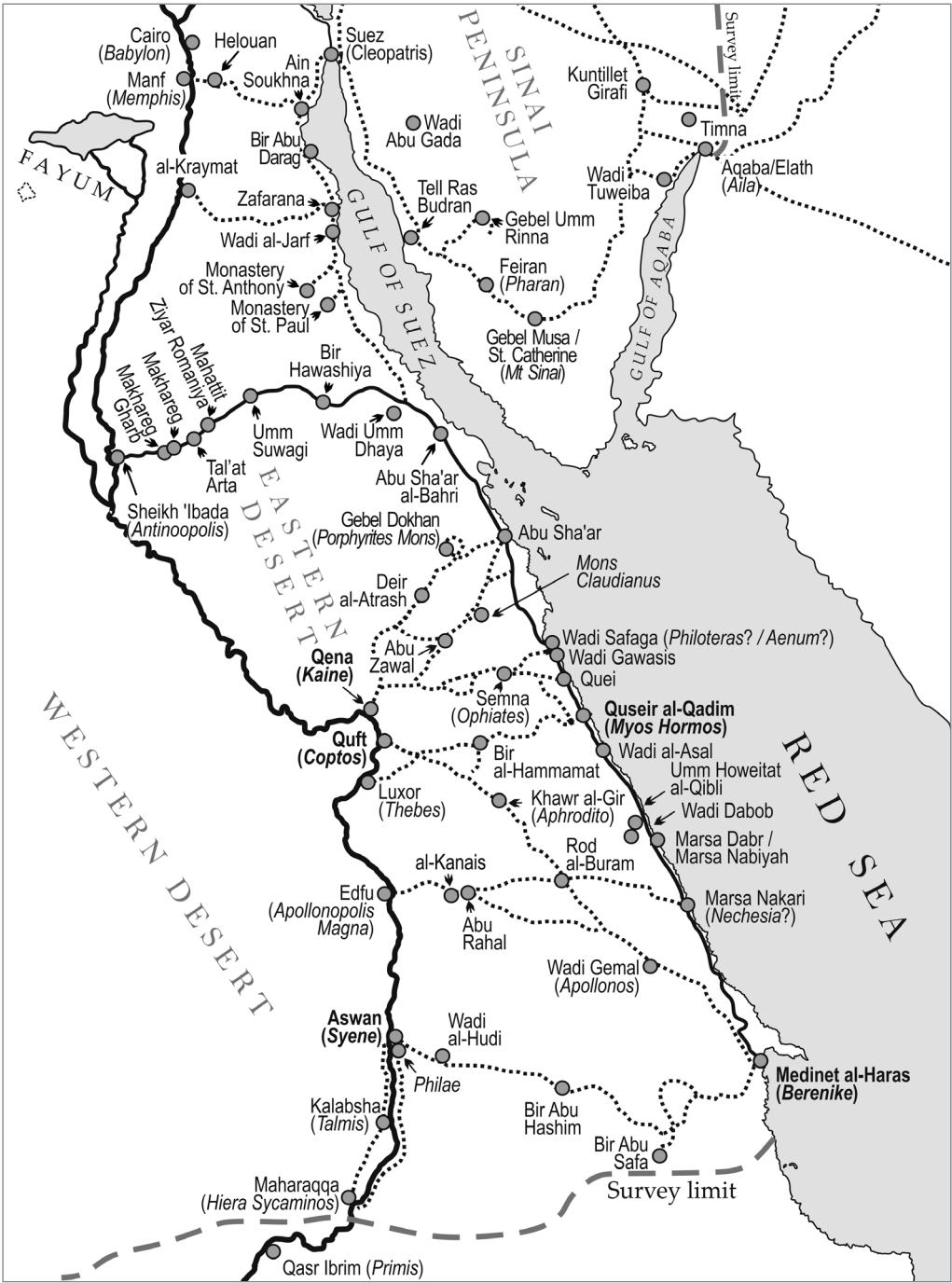


Fig. 5.1 Map 8 - Eastern Desert

Map 8 – Eastern Desert

In terms of road network structures, the Eastern Desert may be roughly divided into three regions. The northern part, delimited by Cairo (*Babylon*), Suez (*Cleopatris*), Sheikh 'Ibada (*Antinoopolis*) and the Red Sea settlement of Abu Sha'ar al-Bahri, was a hotspot of Pharaonic mining activity and a former travel corridor to Sinai. However, it saw very little traffic in the Graeco-Roman period, with the notable exception of Via Nova Hadriana, built in 137 CE. Relevantly, road trajectories in this region are little more than conjecture.

The central part of the Eastern Desert stretches between Sheikh 'Ibada and Abu Sha'ar al-Bahri in the north and Qena (*Kaine*) and Quei in the south. In this prospecting sector, three heavily-guarded Roman roads radiated eastwards from Qena and linked the city to quarries of porphyry (*Mons Porphyrites*), granodiorite (*Mons Claudianus*) and gabbro (*Mons Ophiates/Semna*) as well as to gold and amethyst mines.

The southern region of the desert, extending between Quft (*Coptos*), Quseir al-Qadim (*Myos Hormos*), Maharraqa (*Hiera Sycaminos*) and Medinet al-Haras (*Berenike*), had two main bifurcating road systems linking the Nile Valley to the Red Sea. The northern one linked Quft (*Coptos*) to Myos Hormos and Berenike, Roman ports of call for vessels engaged in the sea trade with India. In turn, the southern road system linked Edfu (*Apollonopolis Magna*) to ports at Marsa Nakari (*Nechesia?*) and Berenike. Being well-travelled under Ptolemies, the Edfu system shows traces of abandonment in the early Roman period. Finally, in the southernmost reaches of the Eastern Desert, one finds two minor roads that connected Aswan (*Syene*) to Berenike and Hiera Sycaminos, the borderlands of Egypt.

Maps and materials consulted: Murray 1925, plate XI; Meredith 1952, 95, fig. 1; Tregenza 1955, 240–241; Sidebotham, Zitterkopf and Riley 1991, 574, fig. 1; Sidebotham 1996, 182, fig. 1; 2011, 126, fig. 8.1; Barrington Atlas (ed. Talbert 2000), map 78.

HELOUAN–AIN SOUKHNA ROAD (section 5.1.1): Helouan → Ain Soukhna

WADI ARABA TRUNK ROAD (al-Kraymat–Zafarana) (section 5.1.2): al-Kraymat → Zafarana

VIA NOVA HADRIANA (section 5.1.3): Sheikh 'Ibada (*Antinoopolis*) → Makhareg Gharb → Makhareg → Tal'at al-Arta → Mahattit Ziyar Romaniya → Umm Sufagi → Bir Hawashiya → Abu Sha'ar al-Bahri → Abu Sha'ar → Wadi Safaga (*Philoteris/Aenum?*) → Wadi Gawasis → Quei → Quseir al-Qadim (*Myos Hormos*) → Wadi al-Asal → Umm Howeitat al-Qibli → Marsa Dabr/Marsa Nabiyah → Marsa Nakari (*Nechesia?*) → Medinet al-Haras (*Berenike*)

SUEZ–WADI UMM DHAYA ROAD (RED SEA COASTAL ROAD) (section 5.1.4): Suez (*Cleopatris*) → Ain Soukhna → Bir Abu Darag → Zafarana → Wadi al-Jarf → [access trails to monasteries of St. Anthony and St. Paul] → [joins Via Nova Hadriana]

HODOS PORPHYRITOU (section 5.2.1): Qena (*Kaine*) → Deir al-Atrash → *Mons Porphyrites* → [possible extension to Abu Sha'ar]

HODOS KLAUDIANE (section 5.2.2): Qena (*Kaine*) → Abu Zawal → *Mons Claudianus/Klaudiane* → [possible extension to the Red Sea shore]

QENA–WADI SAFAGA/QUEI ROAD (section 5.2.3): Qena (*Kaine*) → Semna (*Mons Ophiates*) → [road bifurcates] → (1) Wadi Safaga (*Philoteris/Aenum?*) | → (2) Quei

QUFT–QUSEIR AL-QADIM ROAD (WADI HAMMAMAT/HODOS MYSORMITIKE) (section 5.2.4): Quft (*Coptos*) → Bir al-Hammamat → Quseir al-Qadim (*Myos Hormos*)

QUFT–BERENIKE ROAD (HODOS BERENIKES) (section 5.2.5): Quft (*Coptos*) → Khawr al-Gir (*Aphrodito*) → Rod al-Buram → Wadi Gemal (*Apollonos*) → Medinet al-Haras (*Berenike*)

EDFU–MARSA NAKARI ROAD (section 5.2.7): Edfu (*Apollonopolis Magna*) → al-Kanais → Abu Rahal → Rod al-Buram → Marsa Nakari (*Nechesia?*)

EDFU–BERENIKE ROAD (section 5.2.6): Edfu (*Apollonopolis Magna*) → al-Kanais → Abu Rahal → Wadi Gemal (*Apollonos*) → Medinet al-Haras (*Berenike*)

ASWAN–BERENIKE ROAD (section 5.3.1): Aswan (*Syene*) → Wadi al-Hudi → Bir Abu Hashim → Bir Abu Safa → Medinet al-Haras (*Berenike*)

ASWAN–MAHARAQQA ROAD (section 5.3.2.2): Aswan (*Syene*) → Philae → Maharraqa (*Contra Hiera Sycaminos*)

Graeco-Roman period. The southern subsection, delimited by Wadi Araba in the north and Via Nova Hadriana in the south, witnessed much Graeco-Roman desert traffic, especially in connection to the aforementioned Via Nova Hadriana, built in 137 CE.

The previous desert road surveys in Wadi Araba and Ain Soukhna areas mostly uncovered traces of Pharaonic traffic in the area. Egyptian copper miners had been crossing this stretch of the Eastern Desert for centuries, enticed by the rich turquoise veins of the Sinai Peninsula that they could access by sailing from the Red Sea harbours at Ain Soukhna and Wadi al-Jarf. In contrast, little is known of the Graeco-Roman traffic in the Ain Soukhna/Wadi Araba area. Numerous Nabataean inscriptions found in the region testify to a measure of traffic on these trails under the Romans.⁴ In the Late Roman period, several Christian communities grew up in the mountains by the Red Sea coast; pilgrims visiting these sites used the ancient access trails once trodden by Egyptian miners. In contrast, the southern section of the desert saw a modicum of Greek traffic even before the construction of Via Nova Hadriana, with Ptolemaic prospectors crossing the area to reach quarries at Wadi Umm Dhaya. Nonetheless, it was only after 137 CE when this administrative thoroughfare linked the newly founded Antinoopolis to the Red Sea ports, forging a convenient road connection to the central part of the Red Sea coast.

5.1.1. Helouan–Ain Soukhna road (Maps 2 and 8)

Two little-known roads led from the Nile Valley towns to the Red Sea settlements. The first began in the vicinity of modern Helouan and ran towards Ain Soukhna; the second originated near modern al-Kraymat and terminated in the vicinity of Zafarana by the Red Sea.⁵ Travellers in the Eastern Desert region between Ain Soukhna and Zafarana noted numerous inscriptions and remains dated to the Middle and New

Kingdom; Greek, Nabataean, and Coptic inscriptions were found as well.⁶ The first travellers on this trail were probably Egyptian mining prospectors, who from the 4th Dynasty onwards came from Memphis to the Egyptian harbour installations at modern Ain Soukhna to set sail for the copper- and turquoise-bearing sites in the central Sinai seaboard.⁷ The track between modern Helouan and Ain Soukhna is of special interest to this study due to traces of Late Roman occupation reported south of the track's terminus. At Bir Abu Darag, several kilometres to the south of Ain Soukhna, a small Roman fort was discovered adjacent to a small Christian hermit complex built somewhat later than the fort. Written traces of the Graeco-Roman presence in the area include several short Greek and Coptic inscriptions, the latter group inscribed by hermits from the Christian complex.⁸ The function of this extremely remote military settlement remains unknown. Abd al-Raziq and Passera speculate it could have guarded the caravans following the Red Sea coast northwards in the direction of the Sinai or those about to cross the Eastern Desert westwards to the Nile Valley.⁹ Tellingly, the region abounds in Nabataean inscriptions. According to Meredith, who extensively travelled in the area, industrious Nabataean tribesmen greatly profited from and closely followed the Roman commercial and military activities in the Eastern Desert; unsurprisingly, Nabataean inscriptions tend to adjoin the Roman installations in this region.¹⁰ It is possible that Nabataean inscriptions near Ain Soukhna testify to a measure of the Roman period traffic in the area. In any case, the Helouan → Ain Soukhna track may have been occasionally used in the Roman period if only to provision the fort at Bir Abu Darag.¹¹

5.1.2. Wadi Araba trunk road (al-Kraymat–Zafarana) (Maps 2 and 8)

In the northern part of the Eastern Desert, the mountain chains fall to the flat expanse of the spacious Wadi Araba. This natural communication corridor between Egypt and the Red Sea coast was traversed by the road that led towards the area of modern Egyptian port, Zafarana. Egyptians travelling east along this trail in the Dynastic period were chiefly interested in copper. Eastern Desert sites near the coast abounded in metallic lodes, whereas the harbours of the Red Sea facilitated crossings to even more abundant veins found in the western part of the Sinai Peninsula. After the arrival of Christianity, pilgrims followed the Wadi Araba trail to visit eremitic Red Sea Christian communities of St. Anthony and St. Paul. In the Old Kingdom, Egyptian miners set out from the area of Meidum and Dashur and traversed this Eastern Desert track to a group of copper veins at the northern slopes of Wadi Araba.

Under the 4th Dynasty pharaoh Khufu, the track was frequented chiefly by those seeking to cross the Red Sea to mine turquoise in the Sinai around the Wadi Maghara area. The 4th Dynasty Sinai mining expeditions hugged the southern slopes of Wadi Araba and eventually reached the Red Sea coast. From that point, the Sinai expeditions went to the Sinai works either by land, that is, by circumventing the Red Sea, or by sea, crossing directly from one shore to the other.¹² Those preferring the more direct (ca. 50 kilometres) sea crossing embarked at an Old Kingdom harbour site of Wadi al-Jarf (20 kilometres south of Zafarana) and disembarked at a fortified harbour site

of Tell Ras Budran (the western Sinai seaboard, south of modern Abu Zenima).¹³ Wadi al-Jarf coastal installations dwarfed both Ain Soukhna and Wadi Gawasis harbours in size and scope, proving the reign of Khufu was the time of intense operations in the Sinai copper works, with both turquoise and copper necessary for immense funerary projects launched in the Nile Valley by that pharaoh.¹⁴

The continued use of this pathway in the Middle and New Kingdom period is further attested by cartouches and inscriptions of Mentuhotep IV, Amenemhat I, Sesostris I, and Amenemhat III, carved on rocks close to the track.¹⁵ In the New Kingdom period, the Serabit al-Khadim mines were reopened after a Second Intermediate Period hiatus and mining expeditions once again wandered along Wadi Araba to Pharaonic Red Sea harbours; the thoroughfare in that period was significant enough to be marked with at least one Ramesside stela.¹⁶ Some traces point to the Egyptian use of this track in the Saite period.¹⁷ In the Late Roman period, the Wadi Araba road gained in popularity as an access road to a Christian complex built in the area, the complex known as the Mount of Saint Anthony.¹⁸

Crucially, evidence for Ptolemaic and Early Roman circulations in the Wadi Araba area is extremely rare. Having done many surveys in the area, Gregory Marouard speculated that some of the Wadi Araba trails were sporadically used in the Early Roman period, in connection to local calcite quarry activities. No long-term facilities and occupations dated to the Graeco-Roman periods were found along these pathways; the Wadi Araba is mainly a crossing point where the ancients did not stop without a specific reason, which usually was to exploit local ore and stone deposits.¹⁹ Nabataean inscriptions found in the vicinity of Wadi Dummerana, a tributary of Wadi Araba, indicate this trade corridor was active in the Early Roman period.²⁰ whether it was walked by Nabataeans only or also by inhabitants of Roman Egypt remains to be seen.

5.1.3. *Via Nova Hadriana* (Maps 8, 9, 10)

Via Nova Hadriana, built in 137 CE on Emperor Hadrian's orders, surprisingly did not cut directly through the Eastern Desert as other roads linking the Nile Valley with the Red Sea ports did.²¹ Instead, it took a circuitous route through the northern part of the Eastern Desert, originating at Sheikh 'Ibada (ancient Antinoopolis) and veering northeast towards the coast through the Wadi Tarfa riverbed. After approaching the coastal plain, the road sharply turned south and continued to run parallel to the coast, linking all major Red Sea ports from northwest to southeast and finally coming to Berenike, after 800 kilometres of its run. Its unusual course demonstrates that Via Nova Hadriana was not primarily a commercial thoroughfare; instead, it might have served an administrative function, as it was the only track that linked all Red Sea ports by land.²² Alternatively, Hadrian might have designed it so to redirect the Red Sea traffic into newly-founded Antinoopolis and thus stimulate the city's economic growth;²³ nonetheless, the circuitousness of the emperor's thoroughfare ensured that the Eastern trade wares still came into the Nile Valley via more direct trails, leading from Myos Hormos and Berenike to Coptos.

Characteristically, Via Nova Hadriana paralleled, but only rarely approached, the Red Sea coast as to do so would impede travellers' progress. The Red Sea littoral poses difficulties for road builders in terms of available water supply, terrain topography, and road maintenance efforts. Wells adjacent to the coast frequently run brackish water due to saltwater intrusion into the local water table. From an engineering point, to build a road so close to the Red Sea would entail passing through numerous wadi beds that drain into the sea, making such a hypothetical thoroughfare challenging to build and to follow. Last, flash floods that occasionally occur in the area would have eventually washed away any road that directly crossed rapidly-flooding wadi beds. In contrast, placing Via Hadriana several kilometres inland on an even and higher ground greatly facilitated travel, road maintenance, and provisioning the road stations with potable water.²⁴

An even, smooth thoroughfare of variable width, Via Nova Hadriana was bordered by windrows and small cairns that marked its run in the monotonous desert plain.²⁵ Via Hadriana surveys have divided the road into two distinguishable sections: the east-west desert course and the north-south coastal course. Roman road stations flanking the southern, coastal part of Via Nova Hadriana typically comprised wells (*hydreumata*) or cisterns (*lakkoi/lacci*) hidden inside or placed just beside walled fortlets (*praesidia*).²⁶ The intervals between such stations varied from 12 to 65 kilometres, with a mean value of 32, tallying nicely with a 28-kilometre distance typically covered during a typical day in the desert.²⁷ These spacious, fortified waterholes often attracted local tribesmen or Christian monks, who tended to move into them after the Roman army had vacated the buildings.²⁸ In contrast to their coastal equivalents, the watering installations along the latitudinal road section between Antinoopolis and the Red Sea curiously lack military fortifications or larger residence buildings. Sidebotham, Hense, and Nouwens speculated the remoteness of the land along the Antinoopolis-Red Sea road section obviated the need for defence structures.²⁹ Surveys conducted by Sidebotham indicate the majority of road installations between Antinoopolis and the Red Sea coast come from the 3rd century at the latest. One could thus hypothesise that these installations reflect the early, perhaps deliberately rudimentary road-station design. These relatively well-preserved archaeological sites did not sustain much damage from unfavourable climatic conditions. Unlike the coastal plain, the inner Eastern Desert plateau was somewhat protected from torrential downpours that eroded wadi beds in the vicinity of the Red Sea.³⁰

Thanks to extensive surveys by Sidebotham and his team, we possess an exhaustive list of archaeological sites adjoining Via Nova Hadriana,³¹ with the following catalogue extracted verbatim from Sidebotham's table.³² All sites were dated by adjacent pottery assemblages and architectural remains. Sites marked with asterisks are severely disturbed or do not exist any longer. Certain stations enumerated on the coastal section of Via Nova Hadriana (such as Bir Ria'da) could not be plotted on the maps in this book due to their poorly defined location in the source material. Indeed, it has to be noted that surveys of Via Nova Hadriana sites

did not always produce precise occupation dates, and some sites could have been entirely missed; nonetheless, the available pieces of data tally with those extracted from the other sources and are extensive enough to suggest certain diachronic trends in road infrastructure use.

What follows is a short discussion of these trends. Via Nova Hadriana, different from all other Egyptian desert roads, distinguishes itself chiefly by being perhaps the only desert road in Egypt entirely built by Romans.³³ Hadrian's foundation act in 137 CE marks the road's *terminus post quem*; consequently, sites along the road occupied before that year point to a degree of pre-Hadrianic traffic in the area.³⁴ Curiously, neither the *Antonine Itinerary* nor the *Peutinger Map* mentions Via Nova Hadriana or its road-stations, which may indicate it was an artificial foundation, and by the time these maps were compiled, it had already fallen into disuse. The road infrastructure of Via Nova Hadriana classified by Sidebotham comprises 28 known sites (including termini of Antinoopolis and Berenike), with the trans-desert section including 12 sites and Red Sea coast section encompassing 16 sites. Let us first consider the Red Sea road section. The areas adjacent to the road (chiefly the Red Sea littoral) saw a measure of Ptolemaic desert activity, predominantly connected to quarrying and Red Sea operations. Many of these sites were abandoned before 30 BCE, with a select few continuing to function well into the Roman period (Wadi Dabob gold mine, ports of Marsa Nakari and Berenike and Vetus Hydreuma *praesidia*). 137 CE does not stand for a distinct boundary for these sites. Many of them were already connected to the Nile Valley via other Eastern Desert trails, with Via Nova Hadriana simply becoming yet another thoroughfare in the region. Conversely, the east-west trans-desert section shows no Ptolemaic-Roman site occupation continuity. Only one site, Wadi Umm Dhaya (a settlement and possible quarry), shows signs of Ptolemaic occupation, but it was deserted sometime before 30 BCE. Most of the sites along this section of the road yield were apparently occupied only in the second half of the 2nd century CE, which confirms their post-137 CE origin. Interestingly, assorted road installations suggest the pre-Hadrianic Roman use of the area with three sites surely and three tentatively dated to pre-137 CE period. Wells, cisterns, *praesidia*, and settlements: these Early Roman sites suggest that Via Nova Hadriana might have followed the run of an earlier desert trail that had been furnished with basic road installations. In a different vein, certain sites appear to showcase the effects the 3rd century crisis had on the Egyptian desert transport. Certain sites were probably deserted in the 3rd century CE, only to be repopulated at a later period (Milaha al-Nakhl and Marsa Nakari). Other sites were abandoned altogether (for instance Bir Hawashiya and Abu Gariya), with new sites occupied from the 4th century CE onwards, once the situation stabilised (Abu Sha'ar).

5.1.4. Suez-Wadi Umm Dhaya road (Red Sea coastal road) (Map 2 and 8)

Another desert track might have linked ancient Cleopatris to the Via Nova Hadriana. On his 1925 map, Murray marked a pathway that originated at the tip of the Gulf

Table 5.1 Sites on/near Via Nova Hadriana

	Sites on/near Via Nova Hadriana (after Sidebotham 2011, 128–129; sites marked with * = disturbed, ancient name in italics)	Type of site	Occupied in (dated through pottery/ other remains)
East–west trans-desert section	Sheikh 'Ibada (<i>Antinopolis</i>)	Nile emporium	Roman / Byzantine
	Wadi al-'Ibada quarry	3 small limestone quarries	(?) – likely Roman
	Wadi al-'Ibada road ramp	Road infrastructure	(?) – likely Roman
	Makhareg Gharb	Unidentified structures	2nd–4th (?) c. CE
	Makhareg	Wells/associated structures	Pre- and Early Dynastic lithics / 2nd–5th c. CE
	Tal'at al-Arta	Road station/well	Early Roman–late 4th–5th c. CE
	Tal'at al-Arta road ramp	Road infrastructure	(?) – likely Roman
	Mahattit Ziyar Romaniya	Road stop	Late 1st–2nd /early 3rd (?) c. CE
	Umm Sufagi	Cistern/associated road structures	Early Roman / Late Roman
	Bir Hawashiya	Well/associated road structures	Late 1st/2nd to early 3rd (?) c. CE
	Wadi Umm Dhaya	Settlement/quarry (?)	Ptolemaic inscriptions
	*Abu Sha'ar al-Bahri	<i>Praesidium</i> /wells on road	Early Roman (?) <i>poorly dated</i>
Red Sea section	*Milaha al-Nakhl	Settlement near road	Early Roman (??) / mainly late 4th–5th c. CE
	Abu Sha'ar al-Qibli	<i>Praesidium</i> /wells on road	2nd–5th/6th c. CE
	Abu Sha'ar	Fort near road	4th–late 5th/6th c. CE
	Abu Gariya	<i>Praesidium</i> on road	Late 1st–2nd or early 3rd c. CE
	Wadi Safaga	<i>Praesidium</i> on road	(??) – Early Roman
	Umm Howeitat/Umm Hayatat	Christian settlements near road	5th c. CE
	*Quei	<i>Praesidium</i> on road	(?) – likely Roman
	Quseir al-Qadim (<i>Myos Hormos</i>)	Red Sea port	Ptolemaic, 1st–3rd c. CE, Islamic
	Wadi al-Asal	De facto road stop/no structures	Ptolemaic
	Umm Howeitat al-Qibli	Gold-mining settlement near road	Ptolemaic
	Wadi Dabob	Gold mine off road	(??) – Ptolemaic /Roman
	Marsa Dabr/Marsa Nabiyah	<i>Praesidium</i> on road	Early Roman
	Marsa Nakari (<i>Nechesia?</i>)	Red Sea port	Ptolemaic (?), 1st–2nd/mid-4th–5th c. CE
	Bir Ria'da	Cemetery/well near road	(??)
	Wadi Abu Greiya (<i>Vetus Hydreuma</i>)	Five <i>praesidia</i> on and near the road	Ptolemaic, Early–Late Roman
	Berenike	Red Sea port	3rd c. BCE–6th c. CE

of Suez, hugged the Red Sea coast as it went past Bir Abu Daraq and Zafarana, and turned westwards via dry riverbeds of Wadi Qerf, Wadi Dakhal, and Wadi Tarfah to join Via Nova Hadriana not far from Wadi Umm Dhaya.³⁵ Nabataean inscriptions at sites abutting this trail have suggested to Littmann and Meredith this trail was active at least from the 2nd century CE onwards.³⁶ Sidebotham, Hense, and Nouwens marked the trail on their map and postulated the southern section of this pathway was the Christian road pilgrims from Upper and Middle Egypt took when travelling to monasteries of St. Anthony and St. Paul near Zafarana. Regrettably, Sidebotham, Hense, and Nouwens could not survey this trail in its entirety; therefore, the volume of Early Roman traffic on this track, if any, remains unknown.³⁷

5.2. Roads of the Eastern Desert – central section

In the northern part of the central sector of the desert, three eastward roads radiated from Qena. The northern one, *Hodos Porphyritou/Via Porphyrites* (Porphyry Road), led to Mons Porphyrites (Porphyry Mountain) and the southern one, *Hodos Klaudiane/Via Claudiana* (Claudian Road), to Mons Claudianus (Claudius' Mountain);³⁸ another pathway diverged from the Mons Claudianus trail, striking past gabbro quarries of Semna-Wadi Umm Wikala mining complex towards a purported location of Philoteris harbour.³⁹ Mons Claudianus and Mons Porphyrites sites were of interest to the Roman government due to large marble quarries and gold mines operating in the vicinity, the right to quarry and mine these resources being an imperial monopoly. Stations adjoining these roads varied in design and size. Archaeologists have found large administrative centres with a mixed military-civilian presence at Mons Claudianus, Mons Porphyrites, and Abu Zawal; however, many diminutive fortlets have also been discovered nearby. Despite the lack of uniformity in fortlet design, the installations and roads betray their intended function. The ubiquity of watering lines or troughs and finds of paved road sequences indicate the Mons Claudianus and Mons Porphyrites roads were set for large numbers of animals carrying heavy loads of marble, gold, and other precious resources. By Diocletian's time, these roads have been extended eastwards. Converging near the Red Sea shore, they linked quarries to the newly-built large fort at Abu Sha'ar.⁴⁰

In the southern part of the central sector of the desert, two roads radiated from Coptos to ports of Myos Hormos (modern Quseir al-Qadim) and Berenike, ports of call for vessels engaged in the sea trade with India. Whether to set sail for the more northerly Myos Hormos or more southerly Berenike was largely a matter of choice. Merchants in the Roman period could tack for 270 kilometres against the prevailingly northern winds to Myos Hormos and then face *Hodos Mysormitike*, the shortest desert crossing (174 kilometres) in that section of Egypt.⁴¹ Alternatively, they could unload their wares at Berenike and face the long stretch of desert road (*Hodos Berenikes*) ahead of them (392 kilometres).⁴² Installations along these roads exhibit certain differences in comparison to their northerly equivalents. For instance, one finds certain uniformity in the design of forts at the Myos Hormos road. Several of them

were *quadriburgia* of similar size, mostly square in shape. There was a tendency to place wells inside walls, and buildings often hug the walls; examples of such designs may be found at al-Muweih, al-Zerqah, al-Hamrah, al-Duwi, and other locations.⁴³ Other accommodations demonstrate these two roads were intended for intensive but light movement, as there is no sign of preserved paving or watering lines; understandably, occasional light caravans carrying Indian trade goods would not need hardened road surfaces or constantly-operating water lines.⁴⁴ Not all trails were used at the same time; surveys of road stops on a trail between Edfu (Apollonopolis Magna) to Berenike indicate it had been travelled primarily in the Ptolemaic period and gradually fell out of use in Roman period.⁴⁵

5.2.1. Qena (Kaine)–Mons Porphyrites–Abu Sha’ar road (*Hodos Porphyritou*) (Map 9)

Under Augustus and Tiberius, the Eastern Desert experienced a flurry of Roman activity; these emperors became interested in the mineral riches of this region,⁴⁶ as their prospectors surveyed numerous mountain sites, searching for precious stones.⁴⁷ Of particular interest to this section are two Roman quarrying sites at Mons Porphyrites and Mons Claudianus, distanced ca. 50 kilometres from each other. Operated by well-paid and well-fed civilian stonecutters from the Theban region,⁴⁸ these sites produced copious quantities of hewn stone between the 1st and mid-3rd century CE,⁴⁹ with Mons Porphyrites quarries supplying Rome with rare and coveted imperial porphyry,⁵⁰ and the Mons Claudianus site yielding granodiorite/tonalite gneiss.⁵¹

From Kaine (Qena), a road struck north to link porphyry and granodiorite quarries to the Nile Valley. The said road left from Qena and followed Wadi Qena for 21 kilometres, with the first station a brackish well at al-’Aras, surrounded by animal tethering lines and remains of a *praesidium*.⁵² Here, the track split. The western branch (*Hodos Porphyritou*/*Via Porphyrites*) continued north for 30 kilometres to al-Heita station and then north-east-north, towards the group of imperial porphyry quarries in the vicinity of eponymous Mons Porphyrites (including Umm Balad and Umm Sidri quarries).⁵³ Traversing the rough, rocky terrain, *Via Porphyrites* follows the contours of the natural wadi system. It slips from Wadi Qena to Wadi al-Atrash, traverses the watershed, and falls into Wadi Qattar, follows Wadi Belih, enters Wadi Umm Deheis, and finally reaches the Red Sea coast.⁵⁴ Watering stations on *Via Porphyrites* (al-Saqqia, Bab al-Mukhenig, Deir al-Atrash, Qattar, Badia’), named after these dry riverbeds, were often furnished with animal tethering lines to accommodate thirsty draught animals that hauled stone loads in the desert sun.⁵⁵ At Badia’ site, *Via Porphyrites* branched off the wadi trunk road and struck for Mons Porphyrites quarries.

Remains of erstwhile road infrastructure testify to heavy wheeled traffic moving along this road. Porphyry columns were slowly transported to large ramps at Wadi Umm Sidra, 18 kilometres from Mons Porphyrites, where columns were lowered onto the wagons.⁵⁶ From there, stone blocks began their journey towards the Nile Valley. Wheel tracks, of wagon gauges between 2.13 and 3.35 metres, remain visible

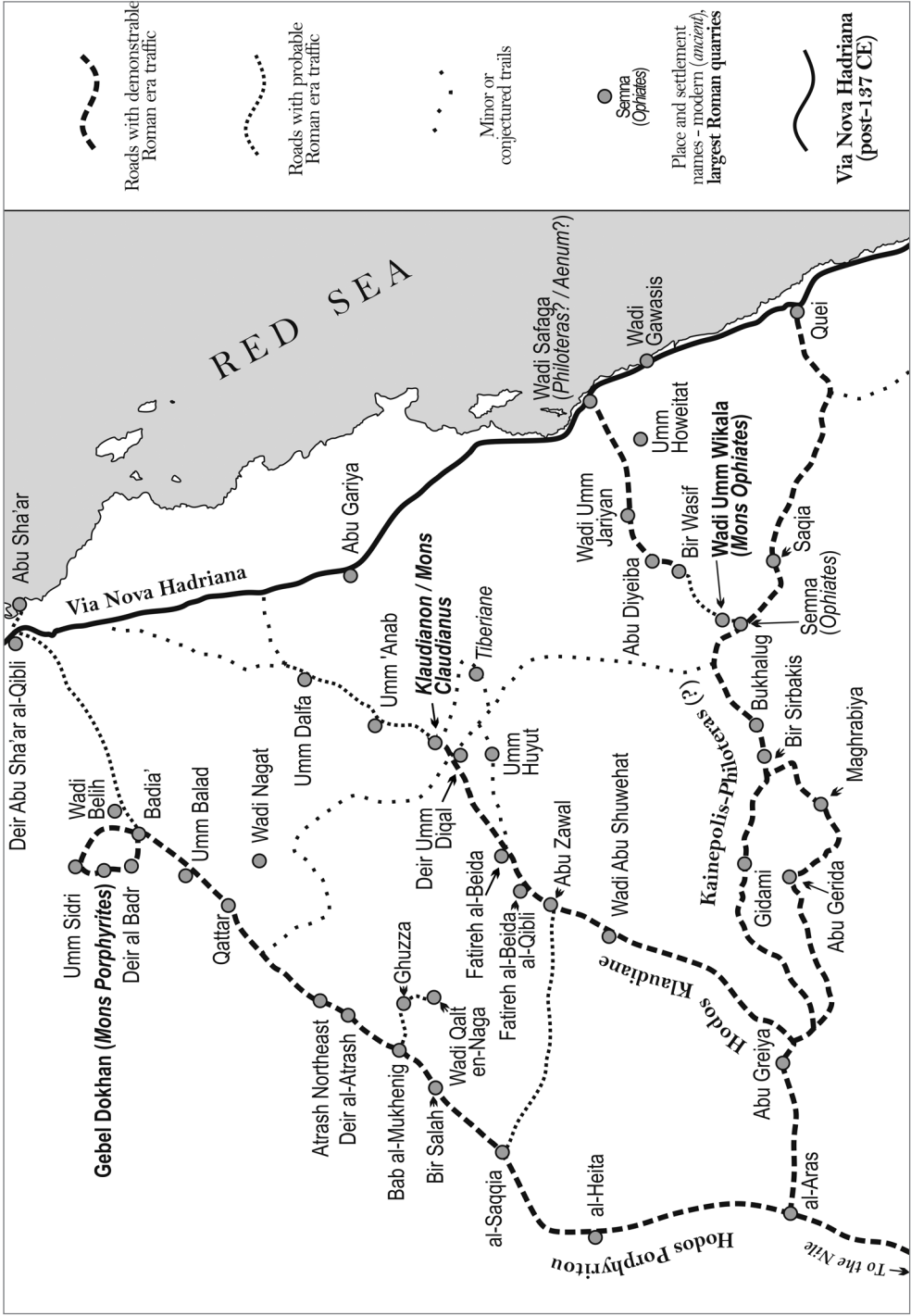


Fig. 5.2 Map 9 - Mons Porphyrites-Mons Claudianus-Mons Ophiates

Map 9 – Mons Porphyrites–Mons Claudianus–Mons Ophiates

In the northern part of the central sector of the Eastern Desert, three roads radiated eastwards from Qena. The northernmost road, *HODOS PORPHYRITOU*/*VIA PORPHYRITES* (Porphyry Road), ran to *Mons Porphyrites* (Porphyry Mountain). The central road, *HODOS KLAUDIANE*/*VIA CLAUDIANA* (Claudian Road) led to granodiorite quarries of *Mons Claudianus* (Claudius' Mountain). The southernmost road diverged from the Mons Claudianus trail, struck past the gabbro quarries of Semna (*Ophiates*)/Wadi Umm Wikala (*Mons Ophiates*), bifurcated and headed towards Quei and Wadi Safaga, the latter a purported location of the as-yet-unidentified *Philoteris/Aenum* ancient harbour. *Via Porphyrites* probably extended beyond Mons Porphyrites to run north-eastwards along the Wadi Bili riverbed and reach the Abu Sha'ar fort at the Red Sea shore. Similarly, *Via Claudiana* most probably continued northeast past Nabataean camping sites of Umm 'Anab and Umm Dalfa, linking Mons Claudianus to the Red Sea fishing harbours. Many minor trails snaked off these three arteries, leading to smaller mines and sites. Only selected examples are depicted here.

This mining district is relatively well surveyed. Earlier maps (Murray 1925, plate XI; Meredith 1952, 95, fig. 1; Tregenza 1955, 240–241) helpfully record many minor trails and sites since disturbed or looted but they tend to haphazardly identify modern sites with ancient toponyms. In turn, Sidebotham's new map (Sidebotham 2011, 126, fig. 8.1) includes a wealth of data from recent extensive surveys. However, due to its large scale, it omits smaller sites. Balancing between these opposites, map no. 78 in *Barrington Atlas of the Greek and Roman World* (2000) remains the most detailed depiction of desert trails in Mons Porphyrites/Mons Claudianus region.

Maps and materials consulted: Murray 1925, plate XI; Meredith 1952, 95, fig. 1; Tregenza 1955, 240–241; Sidebotham, Zitterkopf and Riley 1991, 574, fig. 1; Sidebotham 1996, 182, fig. 1; 2011, 126, fig. 8.1; Barrington Atlas (ed. Talbert 2000), map 78.

HODOS PORPHYRITOU (section 5.2.1): Qena (*Kaine*) (not depicted) → al-Aras → al-Heita → al-Saqia → Bir Salah → Bab al-Mukhenig → [side branch to Ghuzza and Wadi Qalt en-Naga] → Deir al-Atrash → Atrash Northeast → Qattar → Umm Balad → Badia' → Deir al Badr → *Porphyrites Mons* → Umm Sidra → Wadi Belih → [possible extension to Abu Sha'ar]

HODOS KLAUDIANE (section 5.2.2): Qena (*Kaine*) (not depicted) → al-Aras → Wadi Abu Greiya → Wadi Abu Shuwehat → Abu Zawal → Fatireh al-Beida al-Qibli → Fatireh al-Beida → Umm Huyut → Mons Claudianus (*Klaudiane*) → [possible extension to the shore: Umm 'Anab → Umm Dalfa → Abu Gariya]

QENA–WADI SAFAGA/QUEI ROAD (section 5.2.3): Qena (*Kaine*) (not depicted) → al-Aras → Wadi Abu Greiya → [road bifurcates] → Bir Gidami [northern branch] | Abu Gerida [southern branch] → Maghrabiya [southern branch] → [road merges] → Bir Sirbakis → Bukhalug → Semna (*Ophiates*) → [road bifurcates]:

- [northern branch]: Bir Wasif → Abu Diyeiba → Wadi Umm Jariyan → Wadi Safaga (*Philoteris/Aenum*) (?)
- [eastern branch]: Saqia → Quei

VIA NOVA HADRIANA (section 5.1.3): Sheikh 'Ibada (*Antinoopolis*) (not depicted) → Abu Sha'ar al-Qibli/ Abu Sha'ar → Abu Gariya → Wadi Safaga (*Philoteris/Aenum*) (?) → Quei → [continues southward]

in many spots along the road, impressed into the ground by the enormous weight of transported porphyry.⁵⁷ The porphyry trail was well-marked and probably guarded. Surveys uncovered about 125 cairns/towers situated along the road, with some serving as watchtowers and the rest, built in pairs, marking the trail for the wagons.⁵⁸ The road was cleared to facilitate passage. Sharp stones were moved in heaps to the sides of the track, creating windrows.⁵⁹

In the Late Roman period, Via Porphyrites was probably extended beyond Mons Porphyrites to run north-eastwards along the Wadi Bili riverbed for 45 kilometres and finally reach the Abu Sha'ar fort at the Red Sea shore.⁶⁰ On its way, the newly-constructed road bypassed a small (25 × 28 metres) *praesidium* at Wadi Belih, dated to the 1st–2nd century CE.⁶¹ At this enigmatic site, surveys uncovered no traces of wells, cisterns, or animal tethering lines. Its purpose remains unknown. The fort might have guarded the porphyry-producing area against any nomad incursions from the east, or it might have been a satellite road station belonging to Via Nova Hadriana road infrastructure, with that road situated several kilometres to the east.⁶² On its final stretch, the trail bypassed Abu Sha'ar al-Qibli installations (*praesidium*/wells on the road, dated to the 2nd–5th/6th century CE), joined Via Nova Hadriana, and ended its run near the Roman fort at Abu Sha'ar (occupied from the early 4th to late 5th/6th century CE).⁶³ A heavily defended Late Roman military garrison, Abu Sha'ar fort, was for a long time wrongly identified with Myos Hormos.⁶⁴ Founded about 309–310 CE, the fort housed *Ala Nova Maximiana*, a mounted cavalry/dromedary unit of about 150–200 men.⁶⁵ In the late 4th–early 5th century, soldiers peacefully abandoned Abu Sha'ar site; a small Christian community occupied the vacated structure and lived there for an unspecified period of time.⁶⁶

Archaeologists researching the area still debate whether the trail extension linking Mons Porphyrites to the Red Sea coast had been used before the Abu Sha'ar complex was occupied by the Roman military. Preliminary studies imply this linking pathway saw little, if any, traffic before the 4th century CE. Sidebotham's early surveys revealed the Roman military inhabited the coastal forts at 'Abu Sha'ar and at Abu Sha'ar al-Qibli between the late 3rd/4th and 5th century CE; at this time, most road stations on Via Porphyrites had been abandoned, with notable exceptions of Badia', Deir al-Atrash, and al-Heita stops.⁶⁷ Interestingly, in the 4th century CE, the previously abandoned sites of Badia' and al-Heita were reoccupied after a lengthy hiatus.⁶⁸ Reoccupation of Badia' and al-Heita is sometimes linked to the increasing nomad pressure from the south in the Late Roman/Byzantine period, with Sidebotham and Tomber connecting the reoccupation of stations to the construction of the Abu Sha'ar facility.

In Sidebotham's opinion, the installations at Badia', Deir al-Atrash, al-Heita, and Abu Sha'ar, spaced at regular intervals of 40–45 kilometres, formed a new defence line, manned to protect northern areas of Late Roman Egypt from repeated nomadic incursions of southern Beja tribes south.⁶⁹ The Beja were semi-settled Eastern Desert camel raiders, who gradually formed proto-governmental structures and eventually began to push into Roman Egypt and Nubia.⁷⁰ Pressed

by the Beja, Romans could not maintain the integrity of their Egyptian borders and began to withdraw from their southernmost outposts around 250 CE.⁷¹ In 298 CE, Diocletian abandoned the Nubian border area of Dodecaschoenus, which the Empire had controlled since 21–20 BCE,⁷² and moved the border back to Aswan. During the following 50 years, the neighbouring southern power of Meroe also began to lose its hold on the desert border region, creating favourable conditions for Beja expansion.⁷³ The Beja gradually settled in the Nile Valley in the 4th century CE;⁷⁴ in the 5th century CE, they established formal relations with their Roman neighbours and proved to be cunning, belligerent adversaries.⁷⁵ In the meantime, a group of Beja tribes advanced northwards and overran the central portion of the Eastern Desert, reaching as far as the Myos Hormos-Coptos road – or possibly even farther.⁷⁶ However, it should be noted that continuing Beja expansion never severed the links between the Nile Valley and Red Sea ports, even if said ties were somewhat looser in the later period. The fortified defence line between Abu Sha'ar and Kaine secured the northern part of the Eastern Desert from nomadic incursions. Supporting Sidebotham's hypothesis, Roberta Tomber observed that the Mons Porphyrites quarries had been abandoned before the construction of Abu Sha'ar fort and concluded that road sections between the quarries and Abu Sha'ar were most likely not in use before the construction of Abu Sha'ar fort (around the early 4th century CE).⁷⁷ *Contra* Tomber, I believe the short, 45-kilometre track between Wadi Belih and the Red Sea coast saw limited amounts of traffic even before the construction of Abu Sha'ar fort. Construction of Via Nova Hadriana in 137 CE opened a new coastal thoroughfare that could be easily accessed from the Mons Porphyrites complex via Wadi Belih; almost certainly, some of the quarry personnel would use this comfortable coastal road when travelling to the Red Sea ports in the vicinity. In the same vein, the erection of Wadi Belih fort at the eastern flank of the Mons Porphyrites complex implies the fort's builders expected at least a modicum of traffic coming from and to the coast and built the fort to oversee it. In sum, local traffic between the Red Sea and porphyry quarries might have not been as thick as in the Late Roman period, but topography of the area and extant road installations do not suggest it did not exist.

5.2.2. Qena (Kaine)–Mons Claudianus–Abu Gariya (?) road (*Hodos Klaudiane*) (Map 9)

The road linking Kaine to Mons Claudianus branched off Via Porphyrites at al-'Aras station and turned eastwards.⁷⁸ Passing road stations and animal tethering lines at Wadi Abu Greiya, it turned northeast to arrive eventually at a large gold mining settlement and watering station at Abu Zawal/Wadi Fatiri, where a 16-metre deep well provided travellers with water.⁷⁹ Here, a local track branched off, a direct link to al-Saqqia road stop on Via Porphyrites. The Mons Claudianus trunk road continued northeast past quarry settlements at Fatireh al-Beida, in the vicinity of which a Traianic inscription was found,⁸⁰ to diverge into local access roads leading to Umm Huyut and Mons Claudianus granodiorite quarries.⁸¹ In contrast to Via Porphyrites

Table 5.2 Sites on/near Qena-Porphyrates-Abu Sha'ar road

<i>Sites on/near Qena-Porphyrates- Abu Sha'ar road</i>	<i>Type of site</i>	<i>Occupied in (dated through pottery/ other remains)</i>
Qena (<i>Kaine/Maximianopolis</i>)	Nile emporium	(?)-Ptolemaic-Roman-modern
al-'Aras	<i>Praesidium</i> /well/animal tethering lines	1st-4th c. CE
al-Heita/Qasr al-Jin	Two <i>praesidia</i> /wells/animal tethering lines	1st-2nd/late 4th-6th c. CE
al-Saqqia	<i>Praesidium</i> /wells/animal tethering lines	1st-2nd/3rd-4th c. CE
Bir Salah	Stop/well on road	3rd-4th c. CE
Bab al-Mukhenig	Road station/animal tethering lines on road	1st-5th/6th c. CE
Deir al-Atrash	<i>Praesidium</i> /wells/animal tethering lines	1st-6th c. CE
Atrash Northeast	Road stop	(?) – likely Roman
Wadi Nagat	Monastery/settlement off road	4th c. CE (perhaps earlier)
Qattar	<i>Praesidium</i> /wells/animal tethering lines on road	1st-4th c. CE
Umm Balad	<i>Praesidium</i> /quarry	1st-4th c. CE
Badia'	Two <i>praesidia</i> /animal tethering lines on road	1st-2nd and 4th-5th c. CE
<i>Mons Porphyrates</i> /Umm Sidri	Quarry settlement/road station, off road	1st-4th/5th c. CE
Wadi Belih	<i>Praesidium</i> on/near road	1st-2nd c. CE
Abu Sha'ar al-Qibli	<i>Praesidium</i> /wells on road	2nd-5th/6th c. CE
Abu Sha'ar	Fort/monastery	Early 4th-late 5th/6th c. CE

(Table after Sidebotham 2011, 130-131, tab. 8.1.)

stations, Mons Claudianus stops were solely used between the 1st and 4th century CE, with no period of reoccupation after the Abu Sha'ar port was built;⁸² it is thus almost certain that, as soon as the quarries were closed, the road stops and settlements were summarily abandoned.

During its operational phase, the Mons Claudianus site apparently had a road connection to the Red Sea. Having analysed faunal remains at Mons Claudianus trash dump, Van der Veen and Hamilton-Dyer established that civilian stonecutters of Mons Claudianus ate a varied and nutritious diet, with their protein coming mostly from donkey meat and Red Sea fish.⁸³ Furthermore, personal letters found at Mons Claudianus mention fish transports and provide ample evidence of the site being a local hub in marine fish trade;⁸⁴ consequently, an active supply-route must have linked

it to the Red Sea coast, either to the Abu Sha'ar area or to the Abu Gariya region further south. Many scholars studying the area take the Abu Sha'ar-Mons Claudianus fish supply connection for granted; on their survey maps, they perfunctorily mark a trail that originates near Mons Claudianus, crosses into Wadi Dalfa, and strikes northwards for Abu Sha'ar. The trail is either drawn as-is, marked in dotted line, or not marked at all;⁸⁵ importantly, map authors almost never discuss it in any detail.

In contrast, I believe seafood supplies for Mons Claudianus could have also followed a little-known and quite short trail that came to the coast north of a secluded Roman watering station on the Via Nova Hadriana, Abu Gariya.⁸⁶ Two scholars who studied these trails more thoroughly, David Meredith and Leo Tregenza, travelled on foot between Abu Sha'ar and Mons Claudianus. Meredith recorded isolated ruins at Umm Dalfa and Umm 'Anab, which he identified as dating to the Roman period.⁸⁷ Tregenza followed what he described as 'an old camel track'. On his way, he visited Umm 'Anab, an old Arab camping place near a waterhole that abounds in Nabataean inscriptions. One of Tregenza's fellow travellers found a Roman amphora nearby;⁸⁸ regrettably, the sites along this trail were not thoroughly surveyed afterwards.⁸⁹ Tregenza did not uncover any artefacts that would corroborate Meredith's Roman dating, but he did find Nabataean inscriptions at Umm Dalfa and Umm 'Anab and a piece of Imperial porphyry at the latter site.⁹⁰ Considering all factors enumerated above, I imagine those transporting perishable seafood from the coast to Mons Claudianus could certainly favour the shorter, two-day camel crossing from Abu Gariya instead of the longish northward hike from Abu Sha'ar.⁹¹ The proposed shorter seaside link would depart from the coast, wend its way along Wadi Fatiri, Wadi Umm Anab, and Wadi Gariya, bypass sites of Umm Dalfa and Umm 'Anab, and eventually cross the Nile-Red Sea watershed not far from the towering peak of Gebel Shayib. One can hope that future surveys in the area will uncover more details about the connections between the quarries and the Red Sea coast.

5.2.3. *Qena-Wadi Safaga/Quei (Kaine-Philoteris [?]) road (Map 9)*

An ancient road ran from Kaine through auriferous areas north of Wadi Hammamat to the area of modern Red Sea port, Wadi Safaga. During the Dynastic Period, Pharaonic expeditions travelled along this road to the harbour at Wadi Gawasis, from where they sailed to the exotic land of Punt.⁹² In the Ptolemaic period, the track served as an access route to several gold mining installations operating in the region; by the Roman period, the trail lost much of its former significance, with the mines having been abandoned.⁹³ Authorities have claimed the Wadi Safaga region was the location of Philoteris/Aenum,⁹⁴ a minor Red Sea port operating in the Ptolemaic/Early Roman periods, but the exact location of Philoteris has never been determined.⁹⁵

The road linking Kaine to Wadi Safaga was identical to the Mons Claudianus trail as far as Wadi Abu Greiya, where the Philoteris track split and swerved eastwards. The trail briefly forked into two pathways. The northern branch ran by the ruins of a Ptolemaic gold mine and a fortified Roman watering site at Gidami.⁹⁶ The southern branch led through the former Roman fort/iron smelting site at Abu Gerida⁹⁷ and Roman

Table 5.3 Sites on/near on Qena–Mons Claudianus–Abu Gariya (?) road

Sites on/near on Qena–Mons Claudianus–Abu Gariya (?) road	Type of site	Occupied in (dated through pottery/other remains)
Qena (<i>Kaine/Maximianopolis</i>)	Nile emporium	(?)–Ptolemaic–Roman–modern
al-‘Aras	<i>Praesidium</i> /well/animal tethering lines	1st–4th c. CE
Wadi Abu Greiya	Two <i>praesidia</i> /animal tethering lines	Likely 1st–3rd/4th c. CE
Wadi Abu Shuwehat	Road station/animal tethering lines	Likely 1st–3rd/4th c. CE
Abu Zawal	Gold-mining settlement on/near road	Ptolemaic/Roman
Fatireh al-Beida al-Qibli	De facto stop on road	(???)
Fatireh al-Beida	Small quarry settlement	Early Roman
Umm Huyut	Quarry settlement near road	1st–2nd c. CE
<i>Mons Claudianus/Klaudiane</i>	Quarry settlement	1st–3rd/4th c. CE
*Umm ‘Anab (?) ¹	De facto stop on road (?)	Roman (??)/Nabataean
*Umm Dalfa (?) ²	De facto stop on road (?)	Roman (??)/Nabataean
Abu Gariya	<i>Praesidium</i> on road	Late 1st–2nd or early 3rd c. CE

(Table after Sidebotham 2011, 131, data on sites marked with asterisks (*) come from other sources.)

¹ Meredith 1952, 95; Tregenza 1955, 64–66, 73; Klein 1988, 20.

² Murray 1925, 149; Meredith 1952, 95; Tregenza 1955, 80, 83; Klein 1988, 20; Bülow-Jacobsen 1997, 63.

gabbro quarries at Maghrabiya⁹⁸ to converge with the northern branch not far from the Bir Sirbakis gold mine.⁹⁹ Further ahead were abandoned Ptolemaic gold mining installations at Bukhalug¹⁰⁰ and a large Early Roman settlement at Wadi Umm Wikala/Semna complex, known in Latin as *Mons Ophiates* (Snaky Mountain); Wadi Umm Wikala and Wadi Semna, notable gabbro quarrying sites, comprised a Roman castellum, with numerous Roman inscriptions and scribbles found in the vicinity.¹⁰¹ At Semna (*Ophiates*), the road diverged again. One branch struck north via Bir Wasif well, where a Greek inscription and cartouche of Darius I have been found, passed the Ptolemaic/Early Roman amethyst mines at Abu Diyeiba and Roman gold mining installations at Wadi Umm Jariyan to descend to the coast near Early Roman hydreuma at Wadi Safaga.¹⁰² Another branch continued east and ran by the old gold mine at Saqia¹⁰³ to join Via Nova Hadriana at Quei, where a Roman road station is thought to have existed at some point.¹⁰⁴

While hiking in the Wadi Safaga region, Murray measured and recorded the distances between selected stations on the Bir Gidami/Bir Wasif trail branch.¹⁰⁵ Zitterkopf and Sidebotham eventually reconsidered his measurements and calculated that distances between stations on Oena–Wadi Gawasis road averaged 30 kilometres, in

Table 5.4 Sites on/near Qena-Semna-Wadi Safaga/Quei road

<i>Sites on/near Qena-Semna-Wadi Safaga/Quei road (modern / ancient name)</i>	<i>Type of site</i>	<i>Occupied in (dated through pottery/other remains)</i>
Qena (<i>Kaine/Maximianopolis</i>) ¹	Nile emporium	(?)–Ptolemaic–Roman–modern
al-‘Aras ²	<i>Praesidium</i> /well/animal tethering lines	1st–4th c. CE
Wadi Abu Greiya ³	Two <i>praesidia</i> /animal tethering lines	Likely 1st–3rd/4th c. CE
Gidami ⁴ (<i>northern branch</i>)	Well/ <i>praesidium</i> /gold mining settlement	pre-Dynastic (<i>graffiti</i>)/Ptolemaic/Roman (?)
Abu Gerida (<i>southern branch</i>) ⁵	<i>Praesidium</i> /iron ore mine	Pre-Roman/Roman (?)
Maghrabiya (<i>southern branch</i>) ⁶	Gabbro quarry settlement	1st–2nd c. CE
Bir Sirbakis ⁷	Gold mining settlement/station?	Ptolemaic–1st c. CE
Bukhalug ⁸	Gold mining settlement/station?	Ptolemaic
Semna (<i>Ophiates</i>) ⁹	<i>Praesidium</i> /gabbro mining settlement	Dynastic–Ptolemaic–Roman
Bir Wasif ¹⁰ (<i>northward branch</i>)	Well/Christian settlement	Persian / Ptolemaic / Late Roman (5th c. CE)
Abu Diyeiba ¹¹ (<i>northward branch</i>)	Amethyst mines	Ptolemaic–Early Roman
Wadi Umm Jariyan (<i>northward branch</i>) ¹²	Gold mines/cemetery	Roman (?)
Wadi Safaga (<i>Philoteris</i>) ¹³ (<i>northward branch</i>)	<i>Praesidium</i> on road	(??) – Early Roman
Saqia ¹⁴ (<i>eastward branch</i>)	Gold mining settlement/road stop	Ptolemaic–Roman
Quei ¹⁵ (<i>eastward branch</i>)	Road station (?) (<i>ruined</i>)	Roman (?)

¹ Sidebotham 2011, 131.² Murray 1925, 146–147; Sidebotham, Zitterkopf and Riley 1991, 595; Graeff 2005, 147; Sidebotham 2011, 131.³ Sidebotham 2011, 131.⁴ de la Roque 1922, 136–37; Murray 1925, 146; Meredith 1952, 106; Graeff 2005, 151; Barnard 2007c.⁵ Meredith 1952, 106; Sidebotham 1996, 189; Barnard 2007a; Klemm and Klemm 2013, 109.⁶ Sidebotham and Zitterkopf 1996, 189–190.⁷ Meredith 1952, 107, 110; Klemm and Klemm 1994, 219; Sidebotham 1996, 190; Barnard 2007d; Sidebotham, Hense and Nouwens 2008, 221.⁸ Meredith 1952, 110; Barnard 2007e; Sidebotham, Hense and Nouwens 2008, 221.⁹ Tregenza 1950, 85–89; Meredith 1952, 106–107; Cuvigny 1996b, 92; Sidebotham *et al.* 2001, 135–170; Graeff 2005, 151; Barnard 2007f; Sidebotham, Hense and Nouwens 2008, 82–84.¹⁰ de la Roque 1922, 132–133; Murray 1925, 146; Meredith 1953, 102–103; Tregenza 1958, 177–178; Barnard 1977, 140; Graeff 2005, 151; Harrell *et al.* 2006, 129–130.¹¹ Murray 1914, 179; Meredith 1953, 102; Meredith 1957, 117–119; Tregenza 1958, 178–180; Harrell *et al.* 2006, 129–130; Shaw 2007, 146–147.¹² Harrell *et al.* 2006, 130.¹³ Sidebotham and Zitterkopf 1998, 355; Graeff 2005, 152; Harrell *et al.* 2006, 130.¹⁴ Meredith 1952, 111; Tregenza 1958, 146, 176–177.¹⁵ Murray 1925, 149–150; Sidebotham and Zitterkopf 1997, 227, 229.

Table 5.5 Murray (1925) / Zitterkopf-Sidebotham (1989) station interval estimates on Qena-Semna-Wadi Safaga road

Murray (1925) / Zitterkopf-Sidebotham (1989) station interval estimates	Km from Qena	Km from previous station
Qena	0	0
al-'Aras	21	21
Wadi Abu Greiya	44	23
Gidami	73	29
Semna	105	32
Wadi Safaga	151	46
MEAN STATION INTERVAL	30.2 km	

direct contrast to stations on Myos Hormos road, spaced every 16 kilometres or so.¹⁰⁶ Ancient desert travellers could cover up to 36 kilometres a day; indeed, Zitterkopf and Sidebotham noted that Myos Hormos road stations are too close to serve as overnight stays, and their primary function was to house military garrisons guarding the road.¹⁰⁷ It should be noted that, in Murray's day, many of the stations and installations of the Wadi Gawasis run remained unknown; accordingly, he could not have included them in his table. Having roughly measured intervals between already known and newly discovered road stops through satellite images, I discovered that the mean interval value would come closer to 20 kilometres, but distances tend to vary a great deal, with the shortest one of 7 kilometres. In the light of these findings, Kaine-Wadi Safaga road stop intervals appear to reflect more closely the somewhat haphazard patterns of ancient desert travel.

5.2.4. *Quft-Quseir road (Wadi Hammamat trunk road/Hodos Myos Homos/Hodos Mysormitike) (Map 10)*

Dotted with gold mines and siltstone quarries,¹⁰⁸ Wadi Hammamat was an east-west facing valley through which many ancient travellers passed, leaving numerous inscriptions in hieroglyphics, Greek, and Latin.¹⁰⁹ The trunk road that led through Wadi Hammamat (*Myos Hormos road/Hodos Mysormitike*) originated at Coptos, an important trading town at a convergence of two desert roads (*Hodos Mysormitike* and *Hodos Berenikes*), along which the Red Sea trade goods were transported into the Nile Valley.¹¹⁰ The volume of the traffic on *Hodos Mysormitike* was directly related to the volume of cargo that came into the Myos Hormos harbour. Tellingly, Myos Hormos and the road that linked it to the Nile Valley lost much of their significance in the second half of the 1st century CE, when Red Sea merchants began to favour the harbour at Berenike.¹¹¹

The Myos Hormos road left Coptos and turned east, passing a road stop at al-Matula¹¹² and an important watering station at Laqeita (Phoenicon).¹¹³ At Laqeita, the

Table 5.6 Updated geodesic estimates (Google Earth / Barrington Atlas) on station intervals on Qena–Semna–Wadi Safaga road

Updated geodesic estimates (Google Earth / Barrington Atlas)	Km from Qena	Km from previous station
Qena	0	0
al-‘Aras	21	21
Wadi Abu Greiya	44	23
Gidami	73	29
Bir Sirbakis	90	17
Bukhalug	97	7
Semna	127	30
Bir Wasif	148	21
Wadi Umm Jariyan	156	8
Wadi Safaga	182	26
MEAN STATION INTERVAL	20.22 km	

road divided into three tracks. One branch went southeast towards Berenike, whereas another track turned southwest and ran towards Thebes (Luxor).¹¹⁴ In contrast to these trails, *Hodos Mysormitike* continued to run east towards road-stations at Qasr al-Banat and al-Muweih (Krokodilo).¹¹⁵ Excavations at the latter location unearthed a fortified site with a well-preserved water cistern, plus a large number of ostraca recording the traffic on the road, the majority of which has been published by H       Cuvigny and her team.¹¹⁶ In the area surrounding al-Muweih, surveyors found a number of Pharaonic drawings and Latin graffiti, with Roman scribbles left by the fort garrison.¹¹⁷ Further towards Myos Hormos, one encounters a ruined Roman hydreuma at al-Hammamat; modifications to the structure indicate the local inhabitants used the abandoned station as a shrine.¹¹⁸ After leaving al-Hammamat, the road continues east to Fawakhir (ancient Persou), once the most populous settlement complex on the road, comprising two villages and a quarry site.¹¹⁹ It had been assumed that Fawakhir also hosted Roman gold mining installations, but geologists prospecting in the area demonstrated that Fawakhir quartz veins contain little gold, an amount so small that ancient miners would be unable to extract it.¹²⁰ Further ahead lay fortified stations at al-Zerqah (Maximianum),¹²¹ al-Hamrah,¹²² Seyala (possibly to be identified with ancient Simiou)¹²³ and al-Iteima/Duwi/Hammad,¹²⁴ with al-Iteima being the ultimate stop before Myos Hormos. Strabo stated that to travel the entire length of *Hodos Mysormitike* would take about seven days and conceptualised the rectangle of land between towns of Kaine, Apollonopolis Magna, Myos Hormos, and Berenike as a desert isthmus, a narrow strip of land through which the crossing between the Red Sea and the Nile Valley is most expedient.¹²⁵

Having measured the distances between *Hodos Mysormitike* stations, Zitterkopf and Sidebotham concluded, ‘stations are closer together than need be for purely overnight stays [and] (...) were probably located more with a view to security than as a convenience for passing travelers’, a reasonable conclusion if one considers the great value of goods transported along the road.¹²⁸ Another defensive feature of this track built to deter potential robbers was a great number of watchtowers (σκοπελοι, *skopeloi*) placed along the trail’s run. Soldiers (σκοπελάριοι, *skopelarioi*) inhabiting the road stations came every day to watch over the caravan traffic in the Wadi Hammamat corridor.¹²⁹ Some authors speculate these structures played a role in message relays, possibly conveying meaning through smoke/fire signals or reflective shields/flags, but their original mode of operation remains unknown.¹³⁰

The Wadi Hammamat trunk road ended at Myos Hormos (modern Quseir al-Qadim). An important Early Roman port site, Quseir al-Qadim was associated for a time with an as-yet-unidentified port of Leukos Limen/Albus Portus;¹³¹ it was only in the 2000s that the discoveries of Hélène Cuvigny, David Peacock, and Lucy Blue convincingly demonstrated that Quseir al-Qadim once was Myos Hormos.¹³² The area around the port abounds in Early Roman and Islamic remains, pointing to the site's importance in these periods. The first harbour in the area was probably located under modern Quseir, where excavators uncovered Ptolemaic artefacts; in the 1st century CE, the port moved a few kilometres north to the Quseir al-Qadim site, where Myos Hormos would eventually arise. A port of call for Red Sea trade, Myos Hormos directly contended with Berenike for wares and cargo.¹³³ Strabo claimed that, in his day, the bulk of cargo arrived through Myos Hormos, not through Berenike.¹³⁴ Nonetheless, other sources indicate that, thanks to its more southerly location, Berenike became the chief port of call for Indian merchandise; the ancient merchants returning from India preferred to disembark in Berenike rather than to sail to Myos Hormos and tack against the prevailingly northern winds for an additional 270 kilometres alongside jagged coral reefs.¹³⁵ The unfavourable location of the Myos Hormos harbour was not the only factor that ultimately brought about its demise. Never very deep, the port basin in Myos Hormos gradually became shallower due to progressive sediment accumulation and coastline progradation, the processes Romans attempted to counter with repeated dredging.¹³⁶ Obviously, large-scale harbour dredging operations entailed periodical deployment of the trained workforce; the political upheaval of 3rd century CE and increasing nomadic pressure in the area made it economically unfeasible to save the port and forced the inhabitants to evacuate the site at the break of the 3rd century CE. Sometime after Quseir al-Qadim's demise, Quseir once again became the main harbour site

Table 5.7 Sites on/near Hodos Mysormitike

<i>Sites on/near Hodos Mysormitike (modern / ancient name)</i>	<i>Type of site</i>	<i>Occupied in (dated through pottery/other remains)</i>
Quft (Coptos)	Nile emporium	Pharaonic–modern
al-Matula	<i>Praesidium</i> /well	1st–2nd and 5th c. CE or later
*Laqeita (Phoenicon)	<i>Praesidium</i> /wells	At least Early Roman (<i>inscriptions of Claudius and Vespasian</i>)
Qasr al-Banat	<i>Praesidium</i> /well	1st c. BCE–Early Roman (at least)
al-Muweih (Krokodilo)	<i>Praesidium</i> /well	Late 1st–2nd c. CE at least – up to 3rd c. (?)
al-Hammamat	<i>Praesidium</i> /well	At least 2nd c. CE and Islamic
Fawakhir (Persou)	* <i>Praesidium</i> /quarry settlement	Ptolemaic (inscription)–Late Roman/Early Byzantine
al-Zerqah (Maximianum)	<i>Praesidium</i> /well	1st–2nd c. CE at least
al-Hamrah	<i>Praesidium</i> /well	Early Roman
Seyala (Simiou?)	<i>Praesidium</i> /well	2nd c. CE at least
al-Iteima/Duwi/Hammad	<i>Praesidium</i> /well	2nd c. CE at least
Quseir al-Qadim (Myos Hormos)	Red Sea port	Ptolemaic, 1st–3rd c. CE and Islamic

(Table after Sidebotham 2011, 131–132, tab. 8.1. Sites marked with asterisks (*) are severely disturbed or do not exist any longer.)

in the region in the Late Roman period; an important Islamic port, it was finally abandoned in the 15th century CE.¹³⁷

5.2.5. Quft–Berenike road (Hodos Berenikes) (Map 10)

Hodos Berenikes originated at Laqeita road junction, where it split off the Myos Hormos road, turned sharply southeast, and ran for 380 kilometres before it arrived at Berenike, the major port through which Indian goods were imported into Roman borders.¹³⁸ In the Early Roman period, the Coptos–Berenike road grew in importance, putting into the shade the previously important southern track between Berenike and Apollonopolis Magna (Edfu).¹³⁹ The longest direct Nile Valley–Red Sea crossing and a conduit for Indian merchandise, *Hodos Berenikes* was significant enough to merit a mention in Strabo, Pliny, the *Antonine Itinerary*, and the *Peutinger Map*,¹⁴⁰ no other Eastern Desert road was described in such detail and in so many literary sources.

The Coptos–Berenike road struck southeast from Laqeita towards the Didymoi road station (modern Khashm al-Menih/Zeydun). At Didymoi, J. Brun managed to reassemble a badly damaged inscription commemorating the erection of the *praesidium* in 76/77 CE under orders from the prefect of Egypt, Iulius Ursus. The pre-76 CE material at the site implies Didymoi originally functioned as an unfortified

Map 10 – Wadi Hammamat–Hodos Berenikes– Wadi al-Hudi–Aswan District

The southern region of the Eastern Desert had two main bifurcating road systems that linked the Nile Valley to the Red Sea. The northern road system connected Quft (*Coptos*) to Quseir al-Qadim (*Myos Hormos*) and Medinet al-Haras (*Berenike*), Roman ports of call for vessels engaged in the sea trade with India. The Quft–Quseir road (*Hodos Myos Hormos/Hodos Mysormitike*), passing through the gold-bearing region of Wadi Hammamat, saw continuous traffic under the pharaohs, Ptolemies, and Romans, but it lost much of its erstwhile significance in the second half of the 1st century CE, when Red Sea merchants began to favour the harbour of Berenike. The Quft–Medinet al-Haras road (*Coptos–Berenike Road/Hodos Berenikes*), well-garrisoned and supplied, served as the main thoroughfare along which Indian wares entered the Empire in the late 1st and 2nd century CE. Significant enough to merit a mention in Strabo, Pliny, the *Antonine Itinerary*, and the *Peutinger Map*, no other Eastern Desert road was described in such detail and in so many literary sources. In turn, the southern two-pronged road system linked Edfu (*Apollonopolis Magna*) to ports at Marsa Nakari (*Nechesia?*) and Berenike. Very well-travelled under the Ptolemies, the Edfu road system shows puzzling traces of abandonment in the early Roman period.

In the southernmost reaches of the Eastern Desert, one finds two lesser trails that could have connected Aswan (*Syene*) to Berenike and Maharraqa (*Hiera Sycaminos*), the borderlands of Egypt. Ptolemaic elephant-hunting expeditions captured their quarry in modern Sudan and Eritrea, shipped it off to Berenike and drove animals through the desert to the Nile Valley. Sidebotham conjectured that the elephant-driving trail from Berenike to Aswan went through Bir Abu Safa and Wadi al-Hudi, where surveyors found Ptolemaic scribbles and elephant drawings. Another road, following the eastern bank of the Nile between Aswan and Maharraqa, linked a score of Roman fortlets guarding Egypt against nomad incursions from the Eastern Desert. Very little physical evidence for this road came to light; either the road was flooded after the construction of the Aswan Dam or the trail was of minor significance.

Maps and materials consulted: Sidebotham 1996, 182, fig. 1; 2011, 126, fig. 8.1; Barrington Atlas (ed. Talbert 2000), map 80, 81.

VIA NOVA HADRIANA (section 5.1.3): Sheikh ‘Ibada (*Antinoopolis*) (not depicted) → Quseir al-Qadim (*Myos Hormos*) → Marsa Nakari (*Nechesia?*) → Wadi Lahma → Wadi Abu Greia (*Vetus Hydreuma*) → Medinet al-Haras (*Berenike*)

QUFT–QUSEIR ROAD (WADI HAMMAT/HODOS MYOS HORMOS/HODOS MYSORMITIKE) (section 5.2.4): Quft (*Coptos*) → al-Matula → Laqeita (*Phoenicon*) → Qasr al-Banat → al-Muweih (*Krokodilo*) → Bir Umm Hammamat → Fawakhir (*Persou*) → al-Zerqah (*Maximianum*) → al-Hamrah → Seyala (*Simiou?*) → al-Iteima → Quseir al-Qadim (*Myos Hormos*)

QUFT–BERENIKE ROAD (HODOS BERENIKES) (section 5.2.5): Quft (*Coptos*) → al-Matula → Laqeita (*Phoenicon*) → al-Buwaib → Khashm al-Menih/Zeydun (*Didymoi/Dios*) → Bir Menih → Wadi Menih → Khawr al-Gir (*Aphrodito*) → Daghbag South → Daghbag (*Compasi?*) → Gebel Rokham → Abu Greiya (*Iovis/Dios*) → Bezah → Rod al-Buram → Rod Legaya → Gerf (*Aristonis*) → Shay’iet → al-Dweig (*Falacro?*) → Umm Kebash → Umm Gariya → Hilan → Wadi Gemal (*Apollonos*) →

Abu Heilig North → Abu Heilig South → Abu Ghusun (*Cabalsi*) → Abu Ghalqa → Wadi Khashir (*Novum Hydreuma*) → Wadi Abu Greia (*Vetus Hydreuma*) → Siket → Medinet al-Haras (*Berenike*)

EDFU–MARSA NAKARI ROAD (section 5.2.7): Edfu (*Apollonopolis Magna*) → ‘Abbad → al-Kanais (*Hydreuma to epi Paneiou*) → Abu Rahal → Abu Midrik → Samut → Umm Garahish → [side road to Dunqash] → Rod al-Legah → [side road to Sibrit and Hamesh] → Seyhrig → al-Dweig (*Falacro?*) → [joins *Hodos Berenikes*]

EDFU–BERENIKE ROAD (section 5.2.6): Edfu (*Apollonopolis Magna*) → ‘Abbad → al-Kanais (*Hydreuma to epi Paneiou*) → Abu Rahal → Bir ‘Iayyan → Barramiya → Rod al-Buram → Rod Umm al-Farraj → Sheikh Salem → Umm Arba’een → Wadi Hateem → Wadi al-‘Alam → Wadi al-Amboot → Marsa Nakari (*Nechesia?*)

ASWAN–BERENIKE ROAD (section 5.3.1): Aswan (*Syene*) → Wadi al-Hudi → Bir Abu Hashim → Abraq → [side road to Bir Abu Safa] → Shenshef → Medinet al-Haras (*Berenike*)

ASWAN–MAHARAQQA ROAD (section 5.3.2.2): Aswan (*Syene*) → *Philae* → *Contra Taphis* → *Contra Talmis* → *Maharraqa (Contra Hiera Sycaminos)* (not depicted)

hydreuma.¹⁴¹ A secondary trail linked Didymoi to Krokodilo on the Myos Hormos road; travellers crossing between these two stations frequently stopped at a small rock shrine dedicated to Pan (*paneion*), situated in al-Buwaib, 7 kilometres northwest from Didymoi station and 22 kilometres northwest from another Pan shrine at Wadi Menih. Visitors to these shrines left many personal inscriptions in hieroglyphics, Greek, Latin, and Arabic. Those of the Latin autographs that could be dated were engraved between 4 BCE and 35 CE.¹⁴²

Following towards Berenike, a traveller would pass Wadi Menih rock shelter/*paneion* and arrive at the adjacent *praesidium* at Khawr al-Gir (Aphrodito). Its neighbourhood abounds in Greek, Latin, and Nabataean scribbles.¹⁴³ A Latin inscription twinned to equivalent inscriptions at Didymoi and Siket commemorates the fort’s construction in 76/77 CE.¹⁴⁴ Surveys indicated Aphrodito was subsequently abandoned in the 2nd century CE, to be reoccupied over two hundred years later.¹⁴⁵ Further on, a traveller would encounter two major stations at Daghabag and Abu Greiya. The former one, an Early Roman *praesidium* perhaps to be identified with Pliny’s *Compasi*, probably guarded adjacent gold mining installations;¹⁴⁶ the latter one is identified with ancient Iovis or Dios.¹⁴⁷ *Hodos Berenikes* subsequently came to Rod al-Buram station, where the road intersected the track leading from Edfu (*Apollonopolis Magna*) to the Red Sea site of Marsa Nakari, tentatively identified with ancient Nechesia harbour. Surface pottery finds at Rod al-Buram point to Ptolemaic (4th–3rd century BCE) occupation at this site. Sidebotham thought this station first served as a stop on Marsa Nakari road, subsequently rediscovered by Romans and included that chain of *praesidia* and stations that was *Hodos Berenikes*.¹⁴⁸

Leaving Rod al-Buram junction, the Coptos–Berenike road led further southeast towards the *praesidia* at Gerf (Aristonis) and al-Dweig (*Falacro?*).¹⁴⁹ At the latter site,

the Coptos–Berenike road converged with the road that led from Edfu (Apollonopolis Magna) to Berenike.¹⁵⁰ Survey data suggest the Edfu–Berenike crossing, being chiefly travelled in the Ptolemaic period, predated the Coptos–Berenike trail;¹⁵¹ after the advent of Romans, Ptolemaic stations southwest of al-Dweig were included in the new trail, repaired and manned, with several new watering installations and fortlets erected along the way.¹⁵² The next major station down the road was Apollonos fort in Wadi Gemal. A spacious fort, occupied between the 1st and 6th century CE, Apollonos served as a local administration centre and protected desert mining communities in its district.¹⁵³ At Apollonos, a side road branches off to neighbouring beryl/emerald mining and processing installations at Sikait, Nugrus, and Kab Marfu’a. The region, called Mons Smaragdus in Latin, was known by Strabo.¹⁵⁴ Leaving Mons Smaragdus district, *Hodos Berenikes* wended its way through a series of smaller *praesidia*, leaving behind the badly damaged Late Roman station at Abu Ghusun (Cabalsi)¹⁵⁵ and a watering station at Wadi Khashir (Novum Hydreuma), which Sidebotham tentatively dated to the Roman period.¹⁵⁶ The last major complex before Berenike was found at heavily guarded Wadi Abu Greia (Vetus Hydreuma) road junction, where *Hodos Berenikes* converges with Via Nova Hadriana; soldiers garrisoned in five neighbouring *praesidia* watched over the loaded caravans that started their journey towards the Nile Valley.¹⁵⁷ From that point, a traveller on *Hodos Berenikes* would only have to pass a small *praesidium* and well at Siket, constructed – as Didymoi and Aphrodito were – under Vespasian (76/77 CE),¹⁵⁸ to end the long journey in Berenike.

Berenike, founded sometime before 250 BCE by Ptolemy II Philadelphus, began as an animal transport station.¹⁵⁹ Philadelphus and his successors, envious of Seleucid war elephants, sent many hunting expeditions to the Horn of Africa to acquire African pachyderms for military training. Animals caught in Somalia and Sudan were taken to Egypt by sea. To provide the ships transporting captured animals with food, water, and fodder, Ptolemies founded a string of colonies/supply stations on the Red Sea littoral. Elephant hunting expeditions came ashore at Berenike and drove captured beasts through the desert to Edfu, where they were floated downstream to Alexandria.¹⁶⁰ Provisioning Ptolemaic hunters and seamen, Berenike enjoyed its first floruit between the mid-3rd and mid-2nd century BCE.¹⁶¹ The next period of prosperity was to come in the first century CE, when the roaring Indo-Roman trade began,¹⁶² as trade ships exchanged wares between Africa, India, Far East, and Egypt.¹⁶³ Berenike’s heyday ended in the later 2nd and 3rd centuries CE, when political and military upheaval and growing nomadic pressures dampened the trade and brought on stagnation; the city regained some of its former importance in the mid-4th century, but Late Roman Berenike differed much from its Early Roman incarnation.¹⁶⁴ The earlier settlement was militarised and heavily dependent on the Nile Valley supplies, a temporary town for transient merchants who traded in Eastern commodities. Late Roman Berenike was much more self-sustainable than in the previous government-subsidised phase. Unfortunately, diminished resources meant the town’s inhabitants could not stave off the harbour’s demise. Similarly to its sister harbour at Myos Hormos, Berenike’s

port gradually silted up and became unnavigable, with the city abandoned sometime in the 6th century CE.¹⁶⁵

The stations on the road between Coptos and Berenike are described in no less than four sources. The earliest source, Strabo (floruit ca. 10 CE), described the road only in brief (17.1.45):

Thence one crosses an isthmus, which extends to the Red Sea, near a city Berenicê. The city has no harbour, but on account of the favourable lay of the isthmus has convenient landing-places. It is said that Philadelphus was the first person, by means of an army, to cut this road, which is without water, and to build stations, as though for the travels of merchants on camels, and that he did this because the Red Sea was hard to navigate, particularly for those who set sail from its innermost recess. (trans. H. L. Jones)

Pliny the Elder's *Natural History* (published ca. 77–79 CE) provides us with more details on road stations (6.26.102–104).¹⁶⁶

From Keft the journey is made with camels, stations being placed at intervals for the purpose of watering; the first, a stage of 22 miles, is called Hydreuma; the second is in the mountains, a day's journey on; the third at a second place named Hydreuma, 85 miles from Keft; the next is in the mountains; next we come to Apollo's Hydreuma, 184 miles from Keft; again a station in the mountains; then we get to New Hydreuma, 230 miles from Keft. There is also another old Hydreuma known by the name of Trogodyticum, where a guard is stationed on outpost duty at a caravanserai accommodating two thousand travellers; it is seven miles from New Hydreuma. Then comes the town of Berenice, where there is a harbour on the Red Sea, 257 miles from Keft. (trans. H. Rackham)

The *Antonine Itinerary* (*Itinerarium Antonini*), compiled at the break of the 2nd and 3rd centuries and slightly amended in the later period, for the first time, enumerates all major stations on *Hodos Berenikes* and records intervals between them (171.1–173.4).¹⁶⁷

The *Peutinger Map I* (*Tabula Peutingeriana*), surviving as a 12th/13th century copy of an original 4th century Roman map, generally follows the *Antonine Itinerary* but inverts the order of two stations (Didyme and Aphrodito). In his edition, Ball amended the roster to fit the *Itinerary*.¹⁶⁸

Sidebotham, having compared the data extracted from Pliny, *Antonine Itinerary*, and *Peutinger Map*, surmised that apparent discrepancies between Pliny and the itineraries and the level of detail in Pliny's account jointly indicate the writer drew his data on the *Hodos Berenikes* stops from an unknown Early Roman source. In contrast, two itineraries recorded the stops as they were in the 1st century CE, with possible emendations added at the break of the 2nd and 3rd century CE; after that point, the names and order of stations fossilised, copied word for word from manuscript to manuscript. Obviously, all ancient road station rosters account for only the most significant stops; thanks to Sidebotham's surveys on *Hodos Berenikes*, we now know of many minor sites peppering the edges of this desert trail.¹⁶⁹

5.2.6. Edfu–Berenike road (Map 10)

Further to the south, the aforementioned track running from Edfu (Apollonopolis Magna) bifurcated in Abu Rahal. One track branching off at Abu Rahal turned

Table 5.8 Stations on Hodos Berenikes according to *Itinerarium Antonini*

<i>Stations on Hodos Berenikes according to Itinerarium Antonini</i>	<i>Distance in Roman miles</i>	<i>Ball's identification</i>	<i>Actual distance in Roman miles</i>
Copton	0	Quft	0
Poeniconon	24	Laqeita	24
Didyme	24	Ruins at mouth of Wadi Menih	25
Afrodito	20	Bir Minih	23
Compasi	22	Bir Daghabag	21
Iovis	23	Ruins near Bir Beiza	33
Aristonis	25	Ruins in Wadi Garf	22
Falacro	25	Ruins near Gebel Dweiq	22
Apollonos	23	In Wadi Gimal	28
Cabalsi	27	In Wadi Abu Ghusun	26
Cenon Hidreuma	27	Abu Qireiyra	31
Berenicen	18	Madinet al-Haras	17
IN TOTAL	258	IN TOTAL	272

Table 5.9 Stations on Hodos Berenikes according to *Tabula Peutingeriana*

<i>Stations on Hodos Berenikes according to Tabula Peutingeriana (name in Itinerarium)</i>	<i>Distance in Roman miles</i>	<i>Ball's identification</i>	<i>Distance in Roman miles</i>
Hormucopto (the port of Coptos)	0	Quft	0
Phenice (Poeniconon)	12	Laqeita	24
Dydymos (Didyme)	24	Ruins at mouth of Wadi Menih	25
Affrodites (Afrodito)	20	Bir Minih	23
Conpasin (Compasi)	15	Bir Daghabag	21
Dios (Iovis)	22	Ruins near Bir Beiza	33
Xeron (Aristonis)	24	Ruins in Wadi Garf	22
Philacron (Falacro)	24	Ruins near Gebel Dweiq	22
Apollonos	24	In Wadi Gimal	28
Cabau (Cabalsi)	26	In Wadi Abu Ghusun	26
Cennonydroma (Cenon Hidreuma)	29	Abu Qireiyra	31
Pernicide Portum (Berenicen)	22	Madinet al-Haras	17
IN TOTAL	242	IN TOTAL	272

Table 5.10 Sites on/near Hodos Berenikes

<i>Sites on/near Hodos Berenikes (modern / ancient name)</i>	<i>Type of site</i>	<i>Occupied in (dated through pottery/other remains)</i>
Quft (Coptos)	Nile emporium	Pharaonic–Modern
al-Matula	<i>Praesidium</i> /well	1st–2nd and 5th c. CE or later
*Laqeita (<i>Phoenicon</i>)	<i>Praesidium</i> /wells	At least Early Roman (<i>inscriptions of Claudius and Vespasian</i>)
Khashm al-Menih/Zeydun (<i>Didymoi/Dios</i>)	<i>Praesidium</i>	1st–4th and 5th–6th/7th (?) c. CE/Mamluk
Wadi Hima	Stop on road	(??)
al-Buwaib	De facto road stop/graffiti	Pharaonic–Roman
Menih al-Heir South/Bir Menih	Christian settlement (?)	5th–6th c. CE settlement (<i>rock drawings, Pharaonic and later</i>)
Wadi Menih/Menih al-Heir	Rock shelter/shrine (<i>paneion</i>) with graffiti/petroglyphs	Upper Palaeolithic–Modern (<i>with much Roman graffiti</i>)
Khawr al-Gir (<i>Aphrodito</i>)	<i>Praesidium</i>	1st–2nd and 5th c. CE
Daghabag (<i>Compasi?</i>)	<i>Praesidium</i>	1st c. BCE–Early Roman
Daghabag South	<i>Praesidium</i>	Early Roman (?)
Gebel Rokham/Atafla	Marble quarry	Roman–modern
Abu Greiya (<i>Iovis/Dios</i>)	<i>Praesidium</i>	1st–4th c. CE
Bezah	<i>Praesidium</i>	1st–2nd and 5th–6th c. CE
Rod al-Buram	Road station/animal tethering lines	Classical–Hellenistic–Early Roman (?)
Rod Legaya	Stop on road	Early Roman (?)
Gerf (<i>Aristonis</i>)	<i>Praesidium</i>	1st–2nd and 5th–6th/7th (?) c. CE
Sha'it/Shay'iet	Stop on road	(??)
al-Dweig (<i>Falacro?</i>)	<i>Praesidium</i>	Early Roman
Umm Kebash	Road stop	1st–4th/5th c. CE
Umm Gariya/Umm Ushra	<i>Praesidium</i>	Early Roman
Hilan	Station near road	Early and Late Roman
Nugrus, Nugrus West, Abu Rushaid/Nugrus North	Beryl/emerald-mining settlement off road, possible Christian settlement	Early–Late Roman
Umm Heiran	Christian settlement off road	Late Roman
Sikait, Middle Sikait, North Sikait, Wadi Umm Harba	Beryl/emerald processing settlements off road	1st–6th c. CE – Islamic (possibly Ptolemaic)

Table 5.10

<i>Sites on/near Hodos Berenikes (modern / ancient name)</i>	<i>Type of site</i>	<i>Occupied in (dated through pottery/other remains)</i>
Kab Marfu'a East	Beryl/emerald processing settlement (?)	2nd–5th c. CE
Kab Marfu'a/Wadi Gemal north	Beryl/emerald processing settlement (?)	2nd–5th c. CE
Between Wadi Gemal and Gelli	Cemetery	Early and Late Roman
Wadi Gemal (<i>Apollonos</i>)	<i>Praesidium</i>	1st–6th/7th c. CE
Wadi Gemal East	Road station	2nd–4th c. CE
Wadi Duba'	Beryl-emerald-mining settlement off the road	Late 1st c. BCE–early 1st c. CE
Abu Heilig North	<i>Praesidium</i>	Late 4th–5th c. CE
Abu Heilig South	<i>Praesidium</i>	Early Roman, some Late Roman
Abu Ghusun (<i>Cabalsi</i>)	<i>Praesidium</i>	Late 4th–5th c. CE
Abu Ghalqa	<i>Praesidium</i>	5th–6th c. CE
Wadi Khashir (<i>Novum Hydreuma</i>)	Stop on road	(??) probably Roman
Mweillah	Gold-mining settlement off road	Ptolemaic–Early Roman (?)
Wadi Qabr Rijm/Shea'leq/ Mkbea'/Abu Ghurban	Tombs/road stop (?)	Early Roman and 5th c. CE
Wadi Lahma	<i>Praesidium</i> off road	Ptolemaic, 1st–2nd and 4th (?) c. CE
Bint Abu Greiya	Cemetery near road	4th–5th c. CE
Wadi Abu Greia (<i>Vetus Hydreuma</i>)	Five <i>praesidia</i>	Ptolemaic, Early–Late Roman
Siket	<i>Praesidium</i> /well off road	1st–3rd c. CE
Medinet al-Haras (<i>Berenike</i>)	Red Sea port	3rd c. BCE–6th c. CE

(Table after Sidebotham 2011, 133–134, table 8.1. Sites marked with asterisks (*) are severely disturbed or do not exist any longer.)

southeast and ran towards Berenike; from al-Dweig onwards, the track converged with the Coptos–Berenike road.¹⁷⁰ In Ptolemaic times, at least some elephants brought by ships to Berenike were transported along this road to Edfu, where they were floated down the Nile.¹⁷¹ Many hunters and elephant handlers commemorated their safe passage, scribbling on rocks adjacent to the Edfu–Berenike road. At al-Kanais, in a road shrine dedicated to Pan, an individual named Dorion carved a likeness of an elephant during the reign of Ptolemy II (ca. 270–264 BCE); intriguingly, the represented elephant resembles an Indian specimen, implying Dorion knew of elephants driven through al-Kanais towards the Valley, but he had not personally seen them.¹⁷² Similarly, at Redesieh, an east Nile bank village 5 kilometres from Edfu,

an unknown private collector uncovered a small, chipped slab of sandstone inscribed with a votive inscription to Pan, the giver of good hunts.¹⁷³ It was written by a grateful traveller who had been delivered into Ptolemais after being left adrift on the Red Sea; afterwards, the man probably sailed back to Berenike and travelled the desert road between this port and Edfu. According to the editors of this graffiti, it might have been written in the period between 217 and 203 BC, and as such, it demonstrates the road was definitely in use in the 3rd century BCE.¹⁷⁴ However, evidence shows this particular track might have subsequently fallen into disuse, as most installations along it were occupied in Ptolemaic or perhaps Early Roman eras but definitely not in the subsequent period.¹⁷⁵ Significantly, the road's extensive use in the Ptolemaic era and subsequent abandonment in the Roman period bear a resemblance to the site occupation pattern at the coterminous Edfu–Marsa Nakari track, with a distinct Ptolemaic occupation layer and only faint traces of Early Roman presence. Sidebotham hypothesises that wells and cisterns situated along the Berenike–Edfu crossing put too much strain on the local water table and eventually dried up, an unfortunate development that brought on abandonment of these stations.¹⁷⁶ However attractive, this hypothesis has not yet been confirmed by site excavations.

The road to Berenike struck east from Edfu/Apollonopolis Magna and ran towards a small Ptolemaic/Early Roman fort at 'Abbad.¹⁷⁷ Further on, the next stop was at al-Kanaïs (*Hydreuma to epi tou Paneiou*), where a nineteenth Dynasty ruler, Seti I, erected a temple dedicated chiefly to Amen-Re, Re-Horakhty and Ptah.¹⁷⁸ In the Ptolemaic period, a small rock shrine dedicated to Pan appeared in the neighbourhood of the Pharaonic temple; at this *paneion*, desert travellers left their inscribed salutations and thanks in Greek and Latin for their safe passage through the inhospitable waste. After the advent of Romans, a garrison was erected in the vicinity of the still functioning shrine. Following east from the shrine, one arrived at two Ptolemaic (or perhaps Early Roman) road stations at Abu Rahal West and Abu Rahal; this was also the site where the Marsa Nakari track split off and veered east.¹⁷⁹ Having continued along the road, one passed a Ptolemaic fort at Abu Midrik¹⁸⁰ and arrived at Early Ptolemaic (4th–3rd century BCE) gold-mining installations at Samut; at the Bir Samut site to the north, a hill-top fort (Ptolemaic–Early Roman occupation) oversaw the traffic in the vicinity of the gold mines.¹⁸¹ From that site, the trail carried on southeast towards the Ptolemaic gold mining complex at Umm Garahish.¹⁸² Further on were Sibrit and Hamesh, two gold mining settlements of uncertain occupation date,¹⁸³ sandwiched between two Ptolemaic (or perhaps even Early Roman) forts at Rod al-Legah¹⁸⁴ and Seyhrig.¹⁸⁵ Finally, the trail arrived at an Early Roman *praesidium* at al-Dweig (Falacro?),¹⁸⁶ where it joined *Hodos Berenikes*.

5.2.7. Edfu–Marsa Nakari (Apollonopolis Magna–Nechesia [?]) road (Map 10)

In Abu Rahal, a track veered east of the Edfu–Berenike road and ran for ca. 240 kilometres to Marsa Nakari, the site where the ancient port of Nechesia is thought to have been located.¹⁸⁷ Having done several surveys along the road, Sidebotham surmised that at least a western section of this trail (between Abu Rahal and Barramiya) was

Table 5.11 Sites on/near the road between Edfu and al-Dweig

<i>Sites on/near the road between Edfu and al-Dweig (modern / ancient name)</i>	<i>Type of site</i>	<i>Occupied in (dated through pottery/ other remains)</i>
Edfu (Apollonopolis Magna)	Nile emporium	Pharaonic–modern
‘Abbad	Forts	Ptolemaic, Early and Late Roman
al-Kanais (<i>Hydreuma to epi Paneiou</i>)	Fort/related features	Dynastic/Ptolemaic/Early Roman
Abu Rahal West	Road station	Ptolemaic–Early Roman
Abu Rahal	Road station	Ptolemaic–Early Roman, Islamic
Abu Midrik	Fort on road	Ptolemaic
Elevated road segment	Road infrastructure	(?) Ptolemaic
Dunqash	Gold-mining settlement	Dynastic/Roman-Byzantine
Samut North	Gold-mining settlement	4th–3rd c. BCE
Samut	Fort/settlement on road	Ptolemaic–Early Roman
Rod al-Gamra	Hard stone quarry	30th Dynasty–Ptolemaic/Early Roman
Umm Garahish	Gold mines/road stop	Ptolemaic
Rod al-Legah	Fort on road	Ptolemaic–Early Roman
Sibrit	Gold-mining settlement	Unknown
Hamesh	Gold-mining settlement near road	(?) Early Roman
Seyhrig	Fort on road	Ptolemaic–Early Roman/Islamic
al-Dweig (<i>Falacro?</i>)	<i>Praesidium</i>	Early Roman
[joins Coptos–Berenike road]		

(Table after Sidebotham 2011, 135, tab. 8–1.)

furnished with road stops in the reign of Ptolemy II Philadelphus. What is more, remains of road infrastructure and Ptolemaic gold mining installations alongside the entire Edfu–Marsa Nakari trail attest that the trail was travelled during the last three centuries of the 1st millennium BCE; conversely, it is not yet certain whether it saw much traffic in the Roman period.¹⁸⁸

The first stop on the trail, Bir ‘Iayyan, was an unfortified Ptolemaic watering site, where surveyors uncovered an inscribed stele dated to 257 BCE, erected by a local toparch, Rhodon, under Ptolemy II Philadelphus. An unusual find, the stele serves as a milestone, recording the distance from the site to the Nile (461 stades = 97.7 kilometres). As such, it is one of few Graeco-Roman milestones found on Egyptian desert roads.¹⁸⁹ East from Bir ‘Iayyan were gold mining installations at Barramiya.¹⁹⁰ Archaeologists visiting the site noted remains of a large basin surrounded by a

rectangular wall. Sidebotham interprets this structure as a Ptolemaic/Early Roman water cistern/*praesidium*; in contrast, Klemm and Klemm firmly believe the structure served as a Ptolemaic gold washing basin and there were no signs of any Roman activities at the site. Next on the road, one encountered a series of sites furnished with animal tethering lines: Bezah West,¹⁹¹ Rod al-Buram, and Rod Umm al-Farraj.¹⁹² At the Rod al-Buram Ptolemaic site (4th–3rd century BCE pottery shards), Marsa Nakari trail intersected *Hodos Berenikes*.¹⁹³

The eastern section of the trail between Rod al-Buram and Marsa Nakari began with a (no longer extant) road stop at Sheikh Salem, tentatively dated to Ptolemaic and possibly Early Roman periods.¹⁹⁴ Further east followed a Late Roman Christian community at Umm Mureer,¹⁹⁵ sandwiched between two Ptolemaic gold mining settlements at Abu Greiya in Wadi Umm Kharega and Sukkari.¹⁹⁶ As the trail approached the coast, the sites by the road began to yield Late Roman material. One could mention Umm Arba'een Late Roman/Islamic settlement complex and a Late Roman cemetery at Wadi al-'Alam.¹⁹⁷ The ultimate stop before Marsa Nakari was the al-Amboot quarry/gold mining complex, with Ptolemaic gold-mining installations at Wadi al-Amboot¹⁹⁸ and neighbouring Early Roman gypsum/anhydrite quarries.¹⁹⁹

As it is, few sites along the Edfu–Marsa Nakari road were securely dated to the Early Roman period. Most sites have limited amounts of Early Roman material (if any), whereas Late Roman sites, though few and far between, can be dated with more certainty. The paucity of Early Roman material could indicate the road was not travelled in this period. Conversely, discoveries of Late Roman sites situated along the eastern section of the road imply that at least the eastern section of Marsa Nakari trail was travelled in the Late Roman period. It is possible that, by the 4th–5th century CE, the track's western section had been abandoned, but its coastward section was still travelled, albeit as an access road for those coming from the shore to visit inland Late Roman communities.

5.3. Roads of the Eastern Desert – southern section

In the southernmost section of the Eastern Desert, one could distinguish two significant roads. The putative Syene–Berenike trail linked the Red Sea port to the boundary between Egypt and Nubia. In the Nile Valley, two military roads linked the fortlets on the western and eastern Nile bank, leading to Hiera Sycaminos, the southernmost boundary of the Roman Egypt.

5.3.1. Syene–Wadi al-Hudi–Berenike (?) road (Map 10)

After years of surveys, Sidebotham has been led to believe there was at least one or maybe more than one road that linked Berenike to the Nile Valley. Uncovered Graeco-Roman sites suggest another road might have existed between Syene and Berenike, linking sites of Bir Jahaliya, Abraaq, Bir Abu Hashim, and Wadi al-Hudi.²⁰⁰ It is now known that the quarry access road, frequented at least from the Middle Kingdom to Late Roman periods, ran eastwards for 35 kilometres from Syene to

Table 5.12 Sites on/near the Edfu–Marsa Nakari road

<i>Sites on/near the Edfu–Marsa Nakari road (modern / ancient name)</i>	<i>Type of site</i>	<i>Occupied in (dated through pottery/other remains)</i>
Edfu (<i>Apollonopolis Magna</i>)	Nile emporium	Pharaonic–modern
‘Abbad	Forts	Ptolemaic, Early and Late Roman
al-Kanais (<i>Hydreuma to epi Paneiou</i>)	Fort/related features	Dynastic/Ptolemaic/Early Roman
Abu Rahal West	Road station	Ptolemaic–Early Roman
Abu Rahal	Road station	Ptolemaic–Early Roman, Islamic
Bir ‘Iayyan	Road station	Ptolemaic
Barramiya	<i>Praesidium</i> /gold mines on road	Ptolemaic–Early Roman (?)
Bezah West	Road station/animal tethering lines	(??)
Rod al-Buram	Road station/animal tethering lines	Classical–Hellenistic–Early Roman (?)
Rod Umm al-Farraj	Road station/animal tethering lines	Ptolemaic–Early Roman
*Sheikh Salem	Road station	Ptolemaic–Early Roman
Abu Greiya in Wadi Umm Kharega	Gold-mining settlement on/near road	Ptolemaic
Umm Mureer	Christian settlement off road	Late Roman
Sukkari	Gold-mining settlement on/near road	Ptolemaic–Roman–Islamic
Umm Arba’een	Several settlements	Late Roman–Islamic
Wadi Hateem	Settlement	Ptolemaic–Early Roman
Double built up road segment	Road infrastructure	(??)
Wadi al-‘Alam	Cemetery	Late Roman
Wadi al-Amboot	Gold-mining settlement/cemetery	Ptolemaic
al-Amboot	Gypsum/anhydrite quarry off road	Early Roman
Marsa Nakari (<i>Nechesia?</i>)	Red Sea port	Ptolemaic (?), 1st–2nd and 4th–5th c. CE

(Table after Sidebotham 2011, 132–133. Sites marked with asterisks (*) are severely disturbed or do not exist any longer.)

amethyst/gold mining installations in Wadi al-Hudi.²⁰¹ From Wadi al-Hudi, the hypothetical Berenike link would strike eastwards, toward Bir Abu Hashim, an isolated well surrounded by graves.²⁰² Proceeding further in that direction, the traveller would eventually arrive in Abraq, a massive hill-top fort where Ptolemaic and Early Roman pottery shards have been uncovered.²⁰³ Interestingly, it appears the Syene-Berenike trail could have been occasionally used to drive elephants to the Nile Valley. At Abraq, an unknown visitor left a graffito representing an African elephant.²⁰⁴ Indeed, the fort and its neighbourhood must have been quite frequently visited in the Ptolemaic and Roman eras. Thirteen kilometres to the south, at Bir Abu Safa, one finds an extremely remote Ptolemaic water temple by the local spring, with remains of Roman pottery littering the well-travelled trail between these two sites.²⁰⁵ From that point, the putative trail would follow to a well at Bir Jahaliya and to a Ptolemaic gold mining complex at al-Ilegha, to come to the coast near Berenike.²⁰⁶ Regrettably, the run of this track has not yet been surveyed thoroughly enough to demonstrate without doubt that it had been trodden in the Graeco-Roman era; nonetheless, remains at the sites of Abraq and Bir Abu Safa reveal that at least its eastern section was frequented in that period.

5.3.2. Nubian roads parallel to the Nile

In the south, the Nile Valley cut deeply into Nubia, as lands marked by Roman presence gradually passed into territories mostly inhabited by Meroites. It is difficult to estimate the exact extent of the area that was – at least nominally – under Roman control, as the Roman presence in the area waxed and waned at different periods. After the annexation of Egypt in 30 BCE, its first prefect, Cornelius Gallus, managed to subjugate much of Lower Nubia. Nonetheless, in later years, a series of Nubian revolts forced Romans to redraw the frontier line.²⁰⁷ Sometime around 21–20 BCE, Romans and Nubian envoys reached an agreement. Romans had to withdraw partially from the area known as Triakontaschoinos (Greek)/Triakontaschoenus (Latin), ‘Land of Thirty [Greek] Miles’ between the First and Second Cataract that had intermittently been under Ptolemaic control since 275 BCE. However, Romans were able to retain a part of Triakontaschoenus, the said part being Dodecaschoenus, ‘Land of Twelve Miles’, between Syene (modern Aswan) and Hiera Sycaminos (modern Maharraqa).²⁰⁸

Dodecaschoenus served as a militarised transition zone. It was still subject to Roman rule, and the Romans maintained military presence through several outposts within and without the Nile Valley. Even so, soldiers were often drawn from the local population, and local Nubians probably enjoyed relative autonomy from Roman government.²⁰⁹ A string of Roman military fortlets peppered the western Nile bank, with most significant ones located at Taphis (Tafa), Talmis (Kalabsha), Pselchis (Dakka), Corte (probably Qurta), and finally Hiera Sycaminos (Maharraqa).²¹⁰ Most of these fortlets were situated at the western Nile bank as a precaution against roaming nomad tribes in the Eastern Desert, but some had accompanying satellite outposts

Table 5.13 Stations on the Syene–Hiera Sycaminos road according to *Itinerarium Antonini*

Stations on the Syene–Hiera Sycaminos road according to <i>Itinerarium Antonini</i> (alternative name)	Distance in Roman miles	Ball's identification	Actual distance in Roman miles
Siene (Syene)	0	Aswan	0
Filas (Philae)	3	Philae Island	5
Contra Tafis	24	Opposite Teifa	30
Contra Talmis	10	Opposite Kalabsha	6
Contra Pselci (Contra Pselchis)	24	Kuban	36
Contra Hiera Sicamino	10	Opposite Offedunya	9
IN TOTAL	80	IN TOTAL	86

on the eastern Nile bank, outposts that monitored the desert traffic and guarded the river passage.²¹¹ These western bank settlements were linked by a net of desert tracks that paralleled the Nile and provided more direct links between the fortlets; in Nubia, it was oftentimes easier to brave the desert than to follow the winding Valley or to navigate the shallows and cataracts of the Nile.²¹²

5.3.2.1. *Contra Syene–Hierasyaminos (Darb al-Deir) road (Map 19)*

This road is discussed in the chapter on the Western Desert trails (section 6. 8. 4.).

5.3.2.2. *Syene–Contra Hierasyaminos (East Bank) road (Map 10)*

Like its sister road on the West bank of the Nile, this trail linked East Bank satellite outposts of West Bank Roman forts that guarded the river crossings between them and protected the Valley from nomadic incursions from the Eastern Desert. In the case of the East Bank road, no physical traces of an ancient trail had been uncovered before the Dam of Aswan permanently changed the local topography. It could be that these temporary watch posts were never connected by a track as significant and visible as its West Bank counterpart. Accordingly, its exact run and measure of Roman-era traffic it saw are open for interpretation. The *Antonine Itinerary* once again records the stations and intervals on the road; however, let us note that, this time, the distances given are much less accurate, and fewer sites are recorded.²¹³ Whether the East Bank road linked fewer fortlets than its western counterpart or not remains unknown.

Notes

- 1 Sidebotham, Hense and Nouwens 2008, 23–24; Sidebotham 2011, 8–9.
- 2 Bagnall, Bülow-Jacobsen and Cuvigny 2001, 325–333; Sidebotham 2011, 92–99; Amer *et al.* 2012, 13–16; Bard, Fattovich and Manzo 2013, 551.
- 3 Littman and Meredith 1953, 27.
- 4 Littmann and Meredith 1953, 26–27.
- 5 Abd el-Raziq *et al.* 2002, 1–2, 5.

- 6 Littman and Meredith 1953, 1, 26–27 [Nabataean]; Abd el-Raziq *et al.* 2002, 1–2, 35–67 [Dynastic], 68–71 [Greek], Coptic [72–80].
- 7 Tallet 2012, 148–149; 2013, 76; Tallet and Marouard 2012, 40.
- 8 Ghica, Marchand and Marangou 2008, 120–133.
- 9 Abd el-Raziq *et al.* 2002, 15.
- 10 Littman and Meredith 1953, 26–27.
- 11 Abd el-Raziq *et al.* 2002, 115–117.
- 12 Tallet and Marouard 2014, 4, 13.
- 13 Abd el-Raziq *et al.* 2002, 110–113; Mumford 2006, 49–52; Tallet and Marouard 2012, 40; Tallet and Marouard 2014, 4, 13.
- 14 Tallet 2012, 151–153; 2013, 76–84; Tallet and Marouard 2014, 13.
- 15 Abd el-Raziq *et al.* 2002, 103–109.
- 16 Abd el-Raziq *et al.* 2002, 14–15; Brunton 1936, 201.
- 17 Abd el-Raziq *et al.* 2002, 114.
- 18 Littman and Meredith 1953, 1, 26–27.
- 19 Marouard, personal communication.
- 20 Littmann and Meredith 1953, 26–27.
- 21 Sidebotham, Hense and Nouwens 2008, 42–43; Sidebotham 2011, 127–128.
- 22 Murray 1925, 149; Meredith 1953, 101–102; Sidebotham, Hense and Nouwens 2008, 42–43; Sidebotham 2011, 128. Sidebotham argues that its function was analogous to that of Via Nova Traiana, which linked the Syrian city of Bostra to Aila.
- 23 Murray 1925, 150.
- 24 Sidebotham, Hense and Nouwens 2008, 49–50.
- 25 Sidebotham, Hense and Nouwens 2008, 44–45, 47–8. Markedly, windrows and cairns did not always occur together; long sections of the road were marked with just one type of roadsign.
- 26 Sidebotham, Hense and Nouwens 2008, 51–52.
- 27 Ball 1942, 11; Sidebotham, Hense and Nouwens 2008, 50.
- 28 Sidebotham, Hense and Nouwens 2008, 59–60.
- 29 Sidebotham, Hense and Nouwens 2008, 50.
- 30 Sidebotham, Hense and Nouwens 2008, 50–51.
- 31 Sidebotham and Zitterkopf 1997.
- 32 Sidebotham 2011, 129–130, tab. 8.1.
- 33 With a possible exception of the West Bank Nubian road.
- 34 Sidebotham's surveys found a natural pre-Roman extension of Via Hadriana south of Berenike, but its exact run remains unknown (Sidebotham 2011, 136).
- 35 Murray 1925, 138–139.
- 36 Littmann and Meredith 1953, 26–27.
- 37 Sidebotham, Hense and Nouwens 2008, 51.
- 38 Sidebotham, Zitterkopf and Riley 1991; Maxfield 1996, 14; Cuvigny 1996a, 139–145; Van der Veen and Hamilton-Dyer 1998, 108–110; Peacock and Maxfield 2007, *passim*; Klemm and Klemm 2008, 269–280; Sidebotham 2011, 167.
- 39 Ball 1942, 82, 184–185; Meredith 1952, 105, 1953, 101–102, 101, n. 3; Zitterkopf and Sidebotham 1989, 162; Graeff 2005, 152; Cohen 2006, 340–341; Sidebotham 2011, 184; Klemm and Klemm 2013, 12–16; Bard and Fattovich 2013, 549–553.
- 40 Sidebotham, Zitterkopf and Riley 1991; Maxfield 1996, 11–15; Maxfield 2005, 732.
- 41 Sidebotham 1986, 54–67, 80–83, 86–92, 94–96, 99–100, 176–177; Zitterkopf and Sidebotham 1989, 180; Sidebotham 2011, 24, 143; Harrell and Brown 1992, 8; Brun 2003g, 187–206.
- 42 Pliny the Elder, *The Natural History* 27.45; Strabo, *Geography* 17.1.45.; Ball 1942, 146, 158; Sidebotham 1997, 387–388; Sidebotham 2011, 128; Bülow-Jacobsen 2013, 558.
- 43 Maxfield 1996, 12–13.

- 44 Maxfield 1996, 12–14.
- 45 Bagnall 1976, 35; Sidebotham and Zitterkopf 1995, 41, 50; Sidebotham 1997, 386–388; Sidebotham 2011, 160; Bülow-Jacobsen 2013, 558.
- 46 Pliny the Elder, *The Natural History* 36.11.55; Adams 2007, 196–197; Sidebotham 2011, 167.
- 47 For a list of such sites, see Sidebotham 2011, 167.
- 48 Cuvigny 1996a, 139–145; Van der Veen and Hamilton-Dyer 1998, 108–110; Adams 2007, 212. Quarry workers (*pagani*) at Mons Claudianus site ate a nutritious, balanced diet and received 47 drachmae per month, almost twice as much as the mean pay in the Nile Valley (ca. 25 drachmae).
- 49 Tomber 1996, 42.
- 50 Peacock and Maxfield 2007, *passim*; Klemm and Klemm 2008, 269–280; Sidebotham 2011, 167.
- 51 Van der Veen and Hamilton-Dyer 1998, 101; Klemm and Klemm 2008, 280–290; Sidebotham 2011, 167.
- 52 Murray 1925, 146–147; Sidebotham, Zitterkopf and Riley 1991, 595; Graeff 2005, 147.
- 53 Murray 1925, 147–148; Sidebotham, Zitterkopf and Riley 1991, 580–582, 591–594.
- 54 Sidebotham, Zitterkopf and Riley 1991, 595.
- 55 Sidebotham, Zitterkopf and Riley 1991, 578–580, 582–583, 584–591.
- 56 Adams 2007, 199–202; Jackson 2002, 22–23; Sidebotham, Zitterkopf and Riley 1991, 598; Tregenza 1955, 106.
- 57 Murray 1925, 140; Meredith 1952, 102; Tregenza 1955, 106, 208, 212–213, 220, 237–238; Sidebotham, Zitterkopf and Riley 1991, 598; Adams 2007, 199–201; Bülow-Jacobsen 2013, 568–570.
- 58 Sidebotham, Zitterkopf and Riley 1991, 596–597.
- 59 Sidebotham, Zitterkopf and Riley 1991, 600.
- 60 Graeff 2005, 148.
- 61 Maxfield 1996, 18; Sidebotham, Zitterkopf and Riley 1991, 577; Jackson 2002, 23–24; Sidebotham 2011, 130.
- 62 Sidebotham, Zitterkopf and Riley 1991, 577–578.
- 63 Sidebotham 2011, 130, table.
- 64 Couyat 1910, 23–25; Ball 1942, 183–185; for a survey of scholarship on Abu Sha’ar, see Sidebotham, Zitterkopf and Riley (1991, 572).
- 65 Sidebotham, Hense, Nouwens 2008, 57–59.
- 66 Sidebotham, Hense, Nouwens 2008, 59–60.
- 67 Sidebotham, Zitterkopf and Riley 1991, 620.
- 68 Sidebotham, Zitterkopf and Riley 1991, 620; Sidebotham 2011, 130.
- 69 Sidebotham, Zitterkopf and Riley 1991, 621–622.
- 70 Lassanyi 2012, 251, 267.
- 71 Lassanyi 2010, 589.
- 72 Török 2009, 442.
- 73 Dijkstra 2012, 241–242.
- 74 Dijkstra 2012, 242–243.
- 75 Dijkstra 2012, 243–245.
- 76 Dijkstra 2012, 246–247.
- 77 Tomber 1996, 42.
- 78 Murray 1925, 148.
- 79 Murray 1925, 148; Meredith 1952, 101–102, 106; Tregenza 1955, 39–49; Jackson 2002, 68; Sidebotham 2011, 113, 131.
- 80 Sidebotham 1996, 190–192.
- 81 Sidebotham 1996, 186–192.
- 82 Sidebotham 2011, 131.
- 83 Van der Veen and Hamilton-Dyer 1998, 104–105, 109.

- 84 Marzano 2013, 277–278.
- 85 Murray 1925, Plate XI; Meredith 1952, 95; Sidebotham, Zitterkopf and Riley 1991, 574; Maxfield 1996, 10; Van der Veen and Hamilton-Dyer 1998, 102; Jackson 2002, xxvi; Adams 2007, xii; Sidebotham 2011, 126.
- 86 Meredith 1952, 95; Littmann and Meredith 1953, 26; Bülow-Jacobsen 1997, 63.
- 87 Meredith 1952, 95; Klein 1988, 20.
- 88 Tregenza 1955, 64–66, 73.
- 89 Klein mentioned the trail in passing (1988, 20).
- 90 Murray 1925, 149; Littmann and Meredith 1953, 26–27; Tregenza 1955, 80, 83.
- 91 Bülow-Jacobsen 1997, 63; Marzano 2013, 278.
- 92 Meredith 1952, 105–106; Bard and Fattovich 2013, 549–553.
- 93 Klemm and Klemm 2013, 12–16.
- 94 Claudius Ptolemy, *Geography* 4.5; Pliny the Elder, *The Natural History* 6.168; Strabo, *Geography* 16.4.5.
- 95 Ball 1942, 82, 184–185; Meredith 1952, 105, 1953, 101–103, 101, n. 3; Zitterkopf and Sidebotham 1989, 162; Graeff 2005, 152; Cohen 2006, 340–341; Sidebotham 2011, 184.
- 96 Green 1909; de la Roque 1922, 136–37; Murray 1925, 146; Meredith 1952, 106, 110–111; Graeff 2005, 151; Barnard 2007c.
- 97 Meredith 1952, 106; Sidebotham 1996, 189; Barnard 2007a; Klemm and Klemm 2013, 109.
- 98 Sidebotham and Zitterkopf 1996, 189–190.
- 99 Meredith 1952, 107, 110; Klemm and Klemm 1994, 219; Sidebotham 1996, 190; Barnard 2007d; Sidebotham, Hense and Nouwens 2008, 221.
- 100 Meredith 1952, 110; Barnard 2007 (Bukhalug); Sidebotham, Hense and Nouwens 2008, 221.
- 101 Tregenza 1950, 85–89; Meredith 1952, 106–107; Cuvigny 1996b, 92; Sidebotham *et al.* 2001; Barnard 2007f; Sidebotham, Hense and Nouwens 2008, 82–84. An official Roman inscription at Semna mentions *archimetallas* Popilius Iuventius Rufus, who administered mining, pearling, and quarrying installations in the Eastern Desert (Sidebotham, Hense and Nouwens 2008, 84).
- 102 Murray 1925, 146; Graeff 2005, 151; Harrell *et al.* 2006, 129–130.
- 103 Meredith 1952, 111; Tregenza 1958, 146, 176–77.
- 104 Murray 1925, 149–1; Sidebotham and Zitterkopf 1997, 227, 229.
- 105 Murray 1925, 146.
- 106 Zitterkopf and Sidebotham 1989, 169.
- 107 Zitterkopf and Sidebotham 1989, 170.
- 108 Harrell and Brown 1992, 8.
- 109 Couyat and Montet 1912; Goyon 1957; Brun 2003g, 187–206; Sidebotham 2011, 24, 143.
- 110 Sidebotham 1986, 54–67, 80–83, 86–92, 94–96, 99–100, 176–177; Zitterkopf and Sidebotham 1989, 180.
- 111 Brun 2003g, 195–203.
- 112 Zitterkopf and Sidebotham 1989, 179–180.
- 113 Zitterkopf and Sidebotham 1989, 179.
- 114 Murray 1925, Plate XI; Graeff 2005, 169–170.
- 115 Zitterkopf and Sidebotham 1989, 179; Bülow-Jacobsen 1998, 64–65; Reddé 2003a, 73–77.
- 116 Zitterkopf and Sidebotham 1989, 173, 178; Brun 2003a, 77–79, 83–90; Cuvigny 2005.
- 117 Zitterkopf and Sidebotham 1989, 178.
- 118 Brun 2003b, 91–94.
- 119 Brun 2003c, 95–98.
- 120 Harrell and Brown 1992, 10–14; Brun 2003d, 98–100; Klemm and Klemm 2013, 140–141.
- 121 Zitterkopf and Sidebotham 1989, 172, 176–177; Brun 1994, 7–26; Bülow-Jacobsen, Cuvigny and Fournet 1994, 28; Brun and Reddé 2003a, 100–101, 108–126.
- 122 Zitterkopf and Sidebotham 1989, 176; Reddé 2003b, 127–128.

- 123 Zitterkopf and Sidebotham 1989, 175–176; Brun 2003e, 129–132.
- 124 Zitterkopf and Sidebotham 1989, 174–175; Brun 2003f, 133–135.
- 125 Strabo, *Geography* 17.1.45.
- 126 Murray 1925, 149; Prickett 1979, 297–300; Zitterkopf and Sidebotham 1989, 160, n. 19, 187–188; Brun and Reddé 2003b, 136–137.
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- 129 Brun *et al.* 2003, 207–210, 216–226; Zitterkopf and Sidebotham 1989, 180–188.
- 130 Brun *et al.* 2003, 225; Sidebotham 2011, 142; Bülow-Jacobsen 2013, 558.
- 131 Zitterkopf and Sidebotham 1989, 171–172; Bülow-Jacobsen, Cuvigny and Fournet 1994, 27–28; Cohen 2006, 332–338; Sidebotham 2011, 184.
- 132 Blue 2002, 139–145; Cuvigny 2005, 11–30, 77–95, 98–105, 11–112; Peacock and Blue 2006.
- 133 Claudius Ptolemy, *Geography* 4.5.8; Pliny the Elder, *The Natural History* 6.33.168; Strabo, *Geography* 16.4.5, 16.4.24, 16.4.45, 17.1.45; Sidebotham 2011, 184–186.
- 134 Strabo, *Geography* 17.1.45.
- 135 Maxfield 1996, 11; Sidebotham 2011, 184.
- 136 Sidebotham, Hense and Nouwens 2008, 176.
- 137 Sidebotham 2011, 185.
- 138 Sidebotham 2011, 128.
- 139 Sidebotham 1997, 387–388.
- 140 Pliny the Elder, *The Natural History* 27.45; Strabo, *Geography* 17.1.45; Ball 1942, 146, 158.
- 141 Meredith 1952, 95, fig. 1; Sidebotham and Zitterkopf 1995, 48; Bagnall, Bülow-Jacobsen and Cuvigny 2001, 328–333; Sidebotham, Hense and Nouwens 2008, 336.
- 142 Sidebotham and Zitterkopf 1995, 48, 51; Fournet 1995, 206–208; Colin 1998, 92–114; Cuvigny *et al.* 1999, 133–72; Cuvigny and Bülow-Jacobsen 2000, 243–244, 256; Sidebotham, Hense and Nouwens 2008, 342.
- 143 Meredith 1953, 99, n. 1.
- 144 Bagnall, Bülow-Jacobsen and Cuvigny 2001, 327–328; Sidebotham, Hense and Nouwens 2008, 336.
- 145 Meredith 1953, 99; Sidebotham, Hense and Nouwens 2008, 336; Sidebotham 2011, 133, table 8.1.
- 146 Sidebotham, Hense and Nouwens 2008, 335–336.
- 147 Sidebotham and Zitterkopf 1995, 48
- 148 Sidebotham 1997, 388–389
- 149 Sidebotham and Zitterkopf 1995, 48; Sidebotham, Hense and Nouwens 2008, 335.
- 150 Murray 1925, 45; Bernand 1977, 161; Sidebotham and Zitterkopf 1995, 45, 48.
- 151 Sidebotham, Hense and Nouwens 2008, 332–334.
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- 153 Sidebotham, Hense and Nouwens 2008, 242, 299–301.
- 154 Strabo, *Geography* 17.1.45; Murray 1925, 144–145; Meredith 1953, 100; Sidebotham, Hense and Nouwens 2008, 124–1131; 285–299.
- 155 Murray 1925, 144; Sidebotham and Zitterkopf 1995, 45.
- 156 Sidebotham and Zitterkopf 1995, 44–45; Sidebotham 2011, 97.
- 157 Meredith 1953, 100–101; Sidebotham, Hense and Nouwens 2008, 355; Sidebotham 2011, 130–133, 138–139, 166.
- 158 Bagnall, Bülow-Jacobsen and Cuvigny 2001, 325–326; Sidebotham, Hense and Nouwens 2008, 250, 336, 355, 357–358, 360.
- 159 Pliny the Elder, *The Natural History* 6.169; Sidebotham, Hense and Nouwens 2008, 161–162.
- 160 Strabo, *Geography* 16.4.4; Sidebotham, Hense and Nouwens 2008, 162–165; Sidebotham 2011, 41, 186–7.

- 161 Sidebotham, Hense and Nouwens 2008, 161–162; Sidebotham 2011, 55–67.
- 162 Sidebotham, Hense and Nouwens 2008, 171–172; Sidebotham 2011, 68–86, 206–258.
- 163 Strabo, *Geography* 2.5.12; Young 2001, 24–33.
- 164 Sidebotham 2002, 217–240; Sidebotham 2011, 259–282.
- 165 Sidebotham 2002, 217–240; Sidebotham 2011, 272, 279–282.
- 166 Ball 1942, 83.
- 167 Murray 1925, 144; Ball 1942, 146; Sidebotham 2011, 158.
- 168 Ball 1942, 158; Sidebotham 2011, 157–158.
- 169 Sidebotham 2011, 133–134, table 8.1. Sites marked with asterisks are severely disturbed or do not exist any longer.
- 170 Sidebotham 2011, 126–128.
- 171 Sidebotham 2011, 42.
- 172 Bernard 1977, 44–46 (no. 9), plates 54.41–42; Sidebotham and Zitterkopf 1995, 46, fig. 17; Sidebotham, Hense and Nouwens 2008, 163, fig. 7.12; Sidebotham 2011, 41–42, fig. 4.3.
- 173 Householder and Prakken 1945, 108–110.
- 174 Householder and Prakken 1945, 114–116.
- 175 Bagnall 1976, 35; Sidebotham and Zitterkopf 1995, 41, 50; Sidebotham 1997, 386–388; 2011, 160.
- 176 Sidebotham 1997, 388; Sidebotham 2011, 135.
- 177 Sidebotham and Zitterkopf 1995, 45; Sidebotham 2011, 131, 133.
- 178 Bernard 1972, 41–50; Adams 2007, 15–20; Rothe, Miller and Rapp 2008, 200–209; Mairs 2011, 153–164.
- 179 Sidebotham and Zitterkopf 1995, 45; Sidebotham 1997, 387.
- 180 Sidebotham and Zitterkopf 1995, 45, 48; Sidebotham 1997, 387.
- 181 Sidebotham 1997, 387; Bagnall *et al.* 2006, 219–220; Sidebotham, Hense and Nouwens 2008, 235–236; Barnard 2011; Sidebotham 2011, 135; Klemm and Klemm 2013, 238–249.
- 182 Sidebotham 1997, 386–387; Sidebotham and Zitterkopf 1996, 360.
- 183 Sidebotham 2011, 135.
- 184 Sidebotham and Zitterkopf 1995, 45, 47; Sidebotham 1997, 386.
- 185 Sidebotham and Zitterkopf 1995, 45, 47, fig. 11; Sidebotham 1997, 386, 388.
- 186 Murray 1925, 45; Bernard 1977, 161; Sidebotham and Zitterkopf 1995, 45, 48.
- 187 The location of Nechesia has been debated for an exceedingly long time. Limited surveys and excavations at Mersa Nakari uncovered a quantity of Ptolemaic, Early and Late Roman material. See Claudius Ptolemy, *Geography* 4.5.8; Murray 1925, 142–143; Meredith 1953, 103; Bagnall *et al.* 2006, 319–320; Sidebotham 2011, 128, 186.
- 188 Sidebotham 1997, 388–390; 1999, 364–368; 2011, 132; Seeger 2001, 81, 87; Bagnall *et al.* 2006, 319–320; Seeger and Sidebotham 2005. Preliminary Marsa Nakari finds include materials from the 1st–2nd and 4th–5th century CE. No Ptolemaic material has been yet found at the site.
- 189 Bagnall *et al.* 2006, 317–323; Sidebotham 2011, 133.
- 190 Meredith 1953, 95, 97; Klemm and Klemm 1994, 220; Sidebotham and Zitterkopf 1998, 390; Sidebotham 2011, 102, 133; Klemm and Klemm 2013, 193–198.
- 191 Sidebotham and Zitterkopf 1996, 371; Sidebotham 1997, 390; 2011, 132.
- 192 Sidebotham 1999, 366–67; 2011, 132.
- 193 Sidebotham 1997, 388–389; 2011, 132.
- 194 Sidebotham 1999, 366–67; 2011, 132.
- 195 Sidebotham 2011, 132.
- 196 Klemm and Klemm 1994, 206–211, 219–222; Bagnall *et al.* 2006, 319–320; Sidebotham 2011, 132.
- 197 Sidebotham 1999, 365–367; 2011, 132.

- 198 Klemm and Klemm 1994, 206–211, 219–222; 2013, 220–221; Sidebotham 1999, 365–367; Bagnall *et al.* 2006, 319–320.
- 199 Sidebotham 2011, 132.
- 200 Sidebotham and Zitterkopf 1996, 372–382; Sidebotham 2011, 128, 136.
- 201 Graeff 2005, 177–178; Shaw 2007, 141–148; Sidebotham, Hense and Nouwens 2008, 277–282; Sidebotham 2011, 128.
- 202 Sadr 1991, 152; Sidebotham and Zitterkopf 1996, 377–378; Sidebotham 2011, 128.
- 203 Barnard 2007b; Sidebotham 2011, 128.
- 204 Sidebotham and Zitterkopf 1996, 372, 376, figs 21–22; Sidebotham, Hense and Nouwens 2008, 163, fig. 7.11; Sidebotham 2011, 41–42.
- 205 Sidebotham *et al.* 2004, 149–159.
- 206 Sidebotham, Hense and Nouwens 2008, 353; Sidebotham 2011, 128.
- 207 Török 2009, 429–431, 440–442.
- 208 Török 2009, 384, 442.
- 209 Morkot 1996, 83; Török 2009, 444–8.
- 210 Hester, Hobler and Russell 1970, 388.
- 211 Welsby 1996, 69; Hester, Hobler and Russell 1970, 388.
- 212 Morkot 1996, 93.
- 213 Ball 1942, 145.

Roads of the Western Desert

In contrast to the Eastern Desert, the Western Desert of Egypt comprises a staggering variety of landscapes. In the north, the Mediterranean coast between Sallum and the Delta rises towards the rolling Marmarican plateau that eventually plummets sharply into the forbidding Qattara Depression. In the extreme northwestern portion of the depression close to the Libyan border, one finds isolated Siwa Oasis;¹ on its opposite end, the flats rise towards the Nile Valley in the direction of the alkali lakes of Wadi Natrun. Further south, the Qattara Depression gently ascends towards the Egyptian Limestone Plateau, with its 'Eocene limestone formations rising up to more than 500 m above sea level and dropping down to the oases' depressions along escarpments which are up to 400 m high'.²

The four major oases (Bahariya, Farafra, Dakhla, and Kharga) arc across the Western Desert and flank the Plateau from the west, southwest, and south; numerous desert trails transverse the Plateau to connect them to the Nile Valley in the east. The tableland surface they cross is covered partly by rocky outcrops (*hamada*), partly by narrow bands of gravel (*serir*), and partly by shifting sands (*erg*).³ The most important (yet narrow) dune chain, Ghard Abu Muhariq, stretches through the Limestone Plateau from an area north of Bahariya to the northern reaches of Kharga, hindering travel between the Nile Valley and the oases. Larger dune chains stretch to the southwest of the oases, seamlessly blending into the Great Sand Sea that flanks Egypt from the west and protects it from all but the most desperate invaders. In the remote southwest corner of Egypt, the featureless plain soars towards the Gilf Kebir plateau and the Gebel Uweinat mountain range,⁴ the latter area famous for a local hieroglyphic inscription that mentions the fabled lands of Yam and Tekhebet with which Egyptians have intermittently traded.⁵ Southeast of Kharga, the terrain rises again towards the winding Sinn al-Kaddab escarpment, where the land plummets again to meet the Gallaba Pediplain that stretches eastwards towards the Nile Valley.⁶ The local

groundwater basins beneath fragmented limestone uplands of Lower Nubia feed a group of brackish waterholes, known as the Nubian oases, among which one may enumerate Kurkur, Dunqul, Bir Nakheila, Bir Kiseiba, Al-Shabb, and Selima, with many of these watering points populated at one point or another in the Dynastic period.⁷

Unlike the Eastern Desert, the Western Desert terrain poses difficulties in terms of water management and trail navigation. Groundwater can be withdrawn at the low-lying oases, but there are very few wells at the elevated Limestone Plateau because shafts often cannot reach deep enough to access the Aeolian deposits that feed the oases.⁸ Trails of the Eastern Desert lead through easily-followed dry riverbeds; in contrast, navigating the rolling plains and gravel flats of the Western Desert demands special effort. Complex, multidirectional road networks of the Western Desert adapted to the demanding terrain, with travellers in the Western Desert having to rely on road markers, such as cairns, stelae, pottery scatters, and extant trail infrastructure.

6.1. Roads from Alexandria

Alexandria, the capital of the Roman Egypt, was the terminus of at least two desert roads. The Marmarica coastal road went through Taposiris Magna, Cheimo, Antiphrae, and Paraetonium, linking the capital to Catabathmus Maior. The Alexandria–Memphis road went via Schedia, Hermopolis Parva, Andropolis, Niciae, and Letopolis to end its run in Memphis.

6.1.1. Alexandria–Abu Sir–Sallum road (Marmarica coastal main road) (Maps 11 and 13)

Travelled by parties coming from Egypt to Libya and vice versa, the Marmarica coastal road constituted Egypt's main corridor to Cyrenaica. The trail originated in the vicinity of modern Alexandria and ran westwards by the coast, bypassing Graeco-Roman communities of Taposiris Magna (Abu Sir), Cheimo (al-Bordan), Antiphrae (Marina al-Alamein?), Paraetonium (Marsa Matruh), and Catabathmus Maior (Sallum). Several minor trails separated from the seaside main road and turned southwards to cross the Marmarica Plateau and reach the sites at the edge of the Qattara Depression. The western portion of the coastal main road between Abu Sir and Sallum has not been extensively surveyed; in contrast, travellers in the region conducted two significant surveys of the eastern portion of the trail between Abu Sir and Alexandria (the Maryut region). In 1801, a pair of Napoleonic savants, named Charbrol and Lancret, travelled the limestone ridge of Taenia separating the Mediterranean Sea from the Maryut Lake and encountered two parallel stone walls, 100-metres-long and spaced 5–6 metres apart; in the 1930s, De Cosson and Oliver surveyed the region anew through aerial photography and discovered faint traces of former roads crossing the Maryut strip.⁹ An unpaved trail, the Marmarica road in sections surveyed by De Cosson and Oliver was lined by side mounds spaced about 10 metres apart,¹⁰ a different gauge from the one recorded by Charbrol and Lancret. Oliver and De Cosson noted the run of this road was obstructed by pits of several Late Roman quarries and surmised the

track they uncovered must be older than the quarrying installations, perhaps being an old Ramesside trail that linked the Delta to a New Kingdom fort at Zawiyet Umm al-Rakham.¹¹ Graeff hypothesised the Maryut section of the Marmarica road, crossing the narrow ridge between the sea and the lake, must have been rerouted several times to accommodate new industrial and farming developments in the area (hence differences in gauges), although its general run stayed roughly the same. Perhaps this is why the trail's physical remains elude modern surveyors – with the already faint and crisscrossing traces of divergent trails obliterated by extensive sea resort sprawl in the area.¹²

The first region the Marmarica road traversed as it went west from Alexandria was the Maryut strip, a land wedged between the Mediterranean and the Mareotic Lake. The area remained relatively unprotected throughout much of the Dynastic period, in direct contrast to Lower Nubia and Northern Sinai, where chains of garrisons were erected under pharaohs' orders to defend Egypt's limits against nomadic incursions.¹³ This windswept strip of the coast attracted a larger degree of Egyptian interest in the Early New Kingdom period, when Ramesses II's fortress was built at the westernmost point of Egypt, Apis (modern Zawiyet Umm al-Rakham), to guard the area against Libyan nomads invading from the west.¹⁴ It remains an open issue whether the Maryut region and adjacent lands held an entire chain of Ramesside military installations, as Lower Nubia and Northern Sinai did within that period. The surface surveys at al-Alamein and Gharbaniyat found fragments of several stone blocks, many of them inscribed for Ramesses II.¹⁵ More enthusiastic scholars argued these finds marked the sites of former Ramesside forts; unfortunately, most inscribed blocks were found in disturbed contexts, with adjacent ruins scarce in or devoid of Ramesside material.¹⁶ Admittedly, the Maryut strip was of prime strategic importance for the Western Delta, and archaeological finds indicate a military presence in the area throughout much of the Antiquity, but whether it was guarded at that time remains uncertain.

The capital of the region was Marea (modern Hawariyya), an ancient settlement on the southern shore of Lake Mareotis that profited from canals linking the lake to the Nile.¹⁷ Herodotus records that Marea served as a guard post on the Libya-Egypt border during the Twenty-Sixth Dynasty.¹⁸ The region's heyday started in the Persian period, when Marea won independence from Egypt and became a capital of the Libyco-Egyptian kingdom comprised of the lands between the Canopic Nile branch and Cyrenaica. The key player in the local trade and politics, the Mareotic monarch Inaros II first ruled with Persian approval, but he eventually revolted against his overlords. Aided by Athenian forces bent on destabilising Asiatic rule in Egypt, he was ultimately forced to retreat and hid for a year and a half in the marshes before being captured and executed in 454 BCE. The prosperous Mareotic kingdom was ultimately divided, with the Maryut strip reverting to Egypt and the Marmarica coast granted to Libyan rulers. Marea flourished well into the Ptolemaic and Roman periods, eventually becoming an important regional trade hub, thanks to its favourable location.¹⁹

The Marmarica coastal trail was opened in the Graeco-Roman era by Alexander the Great, who marched along the coast while going to Siwa and visited the Osiris temple at Taposiris Magna; Arrian recorded Alexander's march and noted the travellers on the road had limited access to freshwater sources.²⁰ The onset of the Ptolemaic period marked the foundation or resettlement of many sites along the Marmarica road.²¹ The strategic importance of this border region was re-demonstrated by events in 274, when Magas, a Ptolemaic governor of Cyrenaica, rebelled against Ptolemy II and attempted to invade Egypt. Marching along the Marmarica road as far as Cheimo, he eventually turned back upon learning of the revolt that broke out in his Cyrenaican homeland.²² In the Roman period, the coastal main road was often travelled and well-known, with many sources enumerating its installations. The *Stadiasmus of the Great Sea* (a 3rd century CE Greek sailing handbook) records sites along the Marmarica coast, whereas Ptolemy's *Geography* and Strabo (17.14) discuss sites both coastal and inland. Major sources for roads, the *Antonine Itinerary* and the *Peutinger Map*, supplement the data and describe the Marmarica road but record fewer stations than Ptolemy, Strabo, or the *Stadiasmus*.²³

RUN OF THE ROAD

The Marmarica coastal road originated in Alexandria and ran southwest along the Maryut strip, running by a series of Christian monasteries at Pempton, Enaton, and Oktokaidekaton, situated respectively at the fifth, ninth, and eighteenth mile of the road²⁴. In its run, the road traversed the rocky Taenia (ταινία [*tainia*], Greek for 'strip', modern Abu Sir) ridge, from which the region took its name,²⁵ these limestone hills separating the Mediterranean Sea from Lake Mareotis. The ridge abounds in ancient ruins and quarries, the majority of them still unexcavated.²⁶ On its way, the road went by a Pharaonic/Ptolemaic/Roman site at Kom al-Nugus, securely identified with ancient Plinthine. Recent excavations in the vicinity of the site uncovered large amounts of Archaic and Classical Greek imports at the site and demonstrated constant occupation of the site throughout much of the Late and the Graeco-Roman periods.²⁷ The first major settlement on the road was Taposiris Magna (Abu Sir), a major coastal site recently excavated by several French archaeological missions. Occupied in the Graeco-Roman period (3rd century BCE–7th century CE), the city was situated on the southern slope of Taenia ridge facing Lake Mareotis; an important port at the navigable limit of the western portion of the lake, Taposiris accepted and sent on the goods that were shipped to Libya through the Canopic Nile branch and Lake Mareotis.²⁸ Remains of an extensive ancient irrigation system indicate the area was a regional breadbasket and winemaking centre, with ancient authors extolling the taste and quality of Taeniotic and Mareotic wines.²⁹ Today, the site is famous for its miniature replica of the Pharos lighthouse Ptolemy II Philadelphus built there.³⁰

Leaving Taposiris, one encountered a 2-metre-thick limestone wall that bisected the Taenia ridge and protected the town from nomadic incursions from the west.³¹ Passing through a gate in the wall, the road followed westwards for about 20 kilometres to Cheimo (al-Bordan), an ancient harbour site near a village that Rowe identifies

with an Egyptian fishing village Hamu, known for its vineyards; de Cosson believes a local stronghold built at Cheimo safeguarded the western end of the Taenia ridge.³² Continuing west, the road passed al-Imayid, a sprawling Islamic site that some visitors identified with Ptolemy's site of Glaukos; de Cosson questions the veracity of these claims and believes al-Imayid could have been an ancient community of Halmyra.³³

Further west, the Marmarica road continued to hug the coast and eventually came to a large community at modern Marina al-Alamein.³⁴ The area was settled in the Pharaonic period, with visitors to the site encountering red granite and limestone stelae inscribed for Ramesses II.³⁵ Occupation strata indicate, after an indefinite hiatus, the site was reoccupied ca. late 3rd–early 2nd century BCE. In the Roman period, it was occupied mainly between the late 1st and 3rd century CE, ruined by an earthquake in the late 3rd century, and then restored in the late 4th and 5th century CE, although it is possible the site was never completely abandoned.³⁶ Ancient written sources do not provide us with any toponym that could be identified without any reservations with Marina al-Alamein. The site apparently was not Strabo's Leukaspis (17.1.14),³⁷ but the post-3rd century CE occupation phase at Marina al-Alamein could be tentatively identified with Antiphras settlement, mentioned by Ptolemy, Strabo, and the *Stadiasmus*.³⁸

Leaving Marina al-Alamein, the road came to modern Derasiya and Sidi Abd al-Rahman, perhaps to be identified with ancient sites of Derras³⁹ and Comaru.⁴⁰ At the latter site, the Marmarica main road converged with its alternative branch, one I term the Qassabat run. Running more or less parallel to the coastal trail, the Qassabat run struck westwards from Marea through al Qassabat al-Shaqiya and al Qassabat al-Gharbiya, two ancient forts of uncertain age, set 6 kilometres apart. In al Qassabat al-Shaqiya, de Cosson found what he interpreted as remains of a massive Ptolemaic border outpost.⁴¹ At the neighbouring site of al Qassabat al-Gharbiya, de Cosson uncovered further remains of ancient habitation: Graeco-Roman tombs (in his view, Late Ptolemaic) and at least two underground cisterns; Rowe accepted de Cosson's dates for these sites and identified al Qassabat al-Gharbiya with the Roman road station of Monocaminum.⁴² Two sites are linked by a series of wells, called Qusur al Atash, which once provided water to those travelling along the Qassabat run.⁴³ Nine kilometres south of al-Imayid, one finds another mysterious site that could be linked to the Qassabat run, namely Khashm al-Eish. De Cosson and Rowe surveyed a large fortress complex surrounded by water storage installations, and they identified it as a Graeco-Roman military site, guarding the place where the fertile lands around Lake Mareotis meet desert sands.⁴⁴ In the Arabic period, the Qassabat run was part of a road named Darb al-Hagg al-Magharbe, used by pilgrims travelling to Mecca. The pilgrim trail left Khashm al-Eish, followed further east to al Hammam, turned southeast, left the Mareotis region, passed via Wadi Natrun, and arrived in Cairo.⁴⁵

At Derasiya, an ancient traveller left the limits of Mareotis; further ahead lay the last road stations of Graeco-Roman Egypt, Caportis/Patrico,⁴⁶ Pedonia,⁴⁷ and Pnigeus,⁴⁸ tentatively identified with al-Dab'a, Marsa Abu Samra, and al-Gotta. The next major

settlement on the road was Paraetonium (modern Marsa Matruh), a natural harbour reportedly founded by Alexander the Great during his journey to Siwa.⁴⁹ Notwithstanding the legendary foundation of Alexander, the area of Paraetonium was occupied at least since the 14th century BCE, when a group of Cypriote traders established a waystation on a neighbouring sandy islet called Bates' Island;⁵⁰ in turn, excavations at the mainland site unearthed remains of an 8th century BCE entrepot that traded with Greece.⁵¹ Eventually, the mainland settlement evolved into a large Ptolemaic and Roman community, also known as Ammonia, a town important enough to be mentioned by numerous Greek and Roman authors.⁵² Among many impressive buildings found at this site, one might mention an enormous water cistern (900 metres long) built in the Graeco-Roman period to supply the inhabitants of Paraetonium with water. At Paraetonium, a track split off the Marmarica coastal main road and headed southwest, towards Qara and Siwa. This was the so-called Sultan's Road (Masrab al-Istabl) that Alexander the Great travelled when going to the oracle of Ammon (section 6.3.2.).⁵³

The land west of Paraetonium was no longer considered Egypt but instead belonged to the Roman province of Marmarica.⁵⁴ The coastal main road unerringly headed west, passing the Ramesside fortress at Apis (modern Zawiyet Umm al-Rakham)⁵⁵ and road stations/harbours of Zygris (probably modern Marsa Baqqush)⁵⁶ and Ainesisphyra/Ennesyphora/Nesus (modern Marsa Bomba).⁵⁷ The last stop on the Marmarica road that is of interest to this study was Catabathmus Maior (modern Sallum), an ancient port perched precariously on the steep slope of a local cliff, where sparse remains of Graeco-Roman pottery point to the site's occupation in the discussed period.⁵⁸ Significantly, several desert trails radiated southwards from Catabathmus Maior, linking the port to Siwa and Jaghub oases (section 6.3.3).

Concerning the distances between road stations on the Marmarica road, the extant sources provide us with a useful but regrettably incomplete list. The *Antonine Itinerary*, compiled at the break of the 2nd and 3rd centuries and slightly amended in the later period, stands as our best source on the Alexandria–Sallum road. It enumerates all major stations between Catabathmus Maior and Caportis and records intervals between them. Regrettably, the *Itinerary* records neither stations nor intervals between Alexandria and Caportis, although it is certain that the road from Sallum followed eastwards for 108 miles beyond Caportis and eventually reached Alexandria.⁵⁹ The majority of stations along the road remain unidentified.

The *Peutinger Table*, surviving as a 12th/13th century copy of an original 4th century Roman map, is of limited use due to numerous lacunae and discrepancies between recorded and actual station intervals; nonetheless, in direct contrast to the *Itinerary*, it records distances along the entire road between Alexandria and Catabathmus Maior, including the Caportis–Alexandria stretch.⁶⁰

6.1.2. Alexandria–Memphis road (Map 11)

Surprisingly, the road that connected Alexandria to Memphis has only been described in two extant sources, the *Antonine Itinerary* and the *Peutinger Map*. The trail began in Alexandria and at first went along the western bank of a 30-kilometre canal that linked Alexandria to the Canopic branch of the Nile. At the confluence of two waterways,

Table 6.1 Stations on the Alexandria–Sallum road according to *Itinerarium Antonini*

<i>Stations on the Alexandria–Sallum road according to Itinerarium Antonini (alternative name)</i>	<i>Distance in Roman miles</i>	<i>Ball's identification</i>	<i>Actual distances in Roman miles</i>
Alexandria–Caportis	X	Alexandria–al-Dab'a	108
Caportis–Pedona (Pedonia)	16	al-Dab'a–Marsa Abu Samra	16
Pedona (Pedonia)–Euticu	26	Marsa Abu Samra–Marsa Matruh	71 (66 in the Itinerary)
Euticu–Parecomo (Paraetonium)	40	Marsa Matruh–Sallum	143 (128 in the Itinerary)
Parecomo (Paraetonium)–Thabrasta	26		
Thabrasta–Aristeu	32		
Aristeu–Zagilis	20		
Zagilis–Geras	32		
Geras–Catabathmus	18		
IN TOTAL	210+X		338

Table 6.2 Stations on the Alexandria–Sallum road according to *Tabula Peutingeriana*

<i>Stations on the Alexandria–Sallum road according to Tabula Peutingeriana (alternative name)</i>	<i>Distance in Roman miles</i>	<i>Ball's identifications</i>	<i>Actual distances in Roman miles</i>
Alexandria–Tapostri (Taposiris)	25	Alexandria–Abu Sir	32
Tapostri (Taposiris)–[unnamed station]	9	Abu Sir–al-Qassabat al-Gharbiya	42 (9+X in the Itinerary)
[unnamed station]–Monogami (Monocaminum)	X		
Monogami (Monocaminum)–Comaru	15	al-Qassabat al-Gharbiya–Sidi 'Abd al-Rahman	18
Comaru–Patrico (Caportis)	15	Sidi 'Abd al-Rahman–al-Dab'a	20
Patrico (Caportis)–[unnamed station]	X	al-Dab'a–Marsa Matruh	83 (52+X in the Itinerary)
[unnamed station]–Philiscu	28		
Philiscu–Pretonio (Paraetonium)	24		
Pretonio (Paraetonium)–[unnamed station]	X	Marsa Matruh–Sallum	143 (78+X in the Itinerary)
[unnamed station]–Nesus	24		
Nesus–Aratu	26		
Aratu–Catabathmo	28		
IN TOTAL	194+X		338

Map 11 – Alexandria, Maryut and Wadi Natrun

The desert region to the west of the Nile Delta comprises a variety of landscapes. Directly to the southwest of Alexandria, one finds Maryut, an ancient breadbasket region once known for its vineyards and pleasant climate, moderated by the waters of Lake Mareotis. The lake, originally fed by the since-silted arm of the Canopic Nile, is thought to have originally extended as far west as al-Bordan (*Cheimo*). Today, due to land reclamation efforts and suburban spread, the lake's area has shrunk substantially. West of the lake begins the Marmarican Plateau, an inhospitable upland that rises gradually from the shore of the Mediterranean and then plunges sharply into the depths of the Qattara Depression. On this map, the Depression's eastern limit is marked by saline lake Moghra. To the southwest of Maryut stretches the featureless plain once known as the Desert of Sketis: its name comes from famed monastic communities of Skete, clustered around the bitter marshes of Wadi Natrun.

The road network of Maryut visibly partitions into the northern and southern sections, separated by the barren Desert of Sketis. In the north, a narrow isthmus (*Taenia/Tainia*) separates the Mareotic Lake from the Mediterranean. Along it runs the MARMARICA COASTAL ROAD, a vital thoroughfare once connecting Alexandria to Abu Sir (*Taposiris Magna*), Marina al-Alamein (*Antiphrae?*) and Sallum (*Catabathmus Maior*). South of the lake runs a road paralleling the coastal highway, in this work referred to as the QASSABAT RUN; rich in Roman-era remains, this feeder track converged with the coastal highway near Marina al-Alamein. Several minor trails (discussed in section 6.1.3) veered off the Qassabat run and turned southwards to cross the Sketis Desert and reach historic sites at the edge of the Qattara Depression: Roman-era traffic on these trails cannot be excluded, yet no compelling evidence has come to light so far. South of the Sketis Desert, a road known as MASRAB AL-MUHASHAS links Siwa Oasis to Wadi Natrun and, possibly, to Manf (*Memphis*); some believe this to be the road taken by Alexander the Great when he was returning from Siwa to Egypt. The Roman-era traffic between Siwa and Wadi Natrun is likely, whereas the Wadi Natrun–Memphis connection remains unconfirmed.

At the western limit of the Delta, there was once an ancient road linking Alexandria to Memphis; described in the *Antonine Itinerary* and the *Peutinger Map*, the road was certainly used in the Roman period, although its traces have been obliterated by the urban development in the region and its trajectory remains conjectural.

Maps and materials consulted: de Cosson 1935, *passim*, 106–107, 115–116, 130, 135–157; Oliver and de Cosson 1938, 162–175; Fakhry 1973, 14–15; Giddy 1987, 17–18, 36, map 1; Kuhlmann 1988, 170; 2013, 147–148; Barrington Atlas (ed. Talbert 2000), maps 73, 74; Graeff 2000, 17, 26–27, 31–34, maps VI, VII, XVI, XXII; Bergmann and Heinzelmann 2005, 1–2; Szymańska and Babraj 2007, 161–162; Vetter, Rieger and Möller 2013: 461.

MARMARICA COASTAL ROAD (ALEXANDRIA–SALLUM/LIBYA) (section 6.1.1): Alexandria → *Pempton* → *Enaton* → *Oktokaidekaton* → Kom al-Nugus (*Plinthine*) → Abu Sir (*Taposiris Magna*) → al-Bordan (*Cheimo*) → Marina al-Alamein (*Antiphrae?*) → Derasiya (*Derras*) → Sallum (*Catabathmus Maior*) (not depicted)

QASSABAT RUN (MARYUT–MARINA AL-ALAMEIN) (section 6.1.1): Hawariyya (*Marea*) → Bahig → al-Imayid (*Halmyra?*) → al Qassabat al-Shaqiya → wells of Qusur al Atash → al Qassabat al-Gharbiya (*Monocaminum?*) → [road link to Marina al-Alamein]

MASRAB AL-MUHASHAS (SIWA–MANF?) (section 6.2.1/section 6.3.1): Aghurmi (*Ammonos Hieron*) (not depicted) → Qara (*Siropon?/Alexandrou Paremboule?*) (not depicted) → Lake Moghra → Wadi Natrun (*Sketis/Skete*) → Abu Rawash (not depicted) → [merges with Alexandria-Memphis road]

ALEXANDRIA–MEMPHIS ROAD (section 6.1.2): Alexandria → al-Karyun (*Schedia*) → Damanhur (*Hermopolis Parva*) → Kom al-Geif (*Naucratis*) → Kom Abu Billo (*Terenuthis*) → Zawyet Razim (*Niciae?*) → Ausim (*Letopolis*) (not depicted) → Manf (*Memphis*) (not depicted)

travellers entered Schedia, also known as Chereu, Chaireon, and Menelais. Identified with modern Kom al-Giza/al-Karyun, the site has been excavated since 2003 by archaeological missions from the Universities of Göttingen and Cologne.⁶¹ At Schedia, wares from deep-drafted Nile barges were moved onto lighter vessels to float them down the shallower canal to Alexandria;⁶² understandably, the town played a crucial role in supplying Alexandria with goods and the entire Empire with grain.⁶³ Strabo mentions the town comprised a customs house that levied tolls on all wares going up and downstream and narrates that the town took its name from a local pontoon bridge (Σχεδία).

Moving further along the road, a Roman traveller would pass through settlements abutting the Canopus branch of the Nile, first coming to Hermopolis Parva, a sizeable community identified with modern Damanhur,⁶⁴ and then proceeding to either Andropolis (according to the *Antonine Itinerary*) or Naucratis (according to the *Peutinger Map*). The Greek colony of Naucratis was located in the vicinity of modern Kom al-Geif,⁶⁵ but the location of Andropolis still awaits its discovery, with the site having been wrongly identified with modern Kharibta.⁶⁶ The next station on the road was Niciae, tentatively identified as modern Zawyet Razim, a now-levelled tell site abundant in Graeco-Roman pottery shards.⁶⁷ North of Niciae, the Memphis trail bifurcated; a side branch veered southwest at Terenuthis and linked that town to bitter lakes of Wadi Natrun. The Memphis main road proceeded southeast to the city of Letopolis (modern Ausim), the former capital of the second Lower Egyptian nome; finally, the road ended its run in Memphis (modern Manf, erroneously identified by Ball with Mitrahine).

Expectedly, the *Antonine Itinerary* stands as the most comprehensive source on the Alexandria–Memphis road, recording all major stations and distances on the trail.⁶⁸

Table 6.3 Stations on the Alexandria–Memphis road according to *Itinerarium Antonini*

Stations on the Alexandria–Memphis road according to <i>Itinerarium Antonini</i> (alternative name)	Distance in Roman miles	Ball's identification	Actual distance in Roman miles
Alexandria–Chereu	24	Alexandria–al-Karyun	20
Chereu–Hermupoli (Hermopolis Parva)	20	al-Karyun–Damanhur	20
Hermupoli (Hermopolis Parva)–Andro (Andropolis)	21	Damanhur–Khirbita [incorrect]	26
Andro (Andropolis)–Niciu (Niciae)	31	Khirbita [incorrect]–Zawyet Razim	29
Niciu (Niciae)–Letus (Letopolis)	29	Zawyet Razim–Ausim	29
Letus (Letopolis)–Memphi (Memphis)	20	Ausim–Mitrahine	22
IN TOTAL	145	IN TOTAL	146

Table 6.4 Stations on the Memphis–Melcati (?) road according to *Tabula Peutingeriana*

Stations on the Memphis–Melcati (?) road according to <i>Tabula Peutingeriana</i> (alternative name)	Distance in Roman miles	Ball's identification	Actual distance in Roman miles
Memphis–Auleu (Letus, Letopolis)	24	Mitrahine–Ausim	22
Auleu (Letus, Letopolis)–Niciu	36	Ausim–Zawyet Razim	29
Niciu–Naucrati	43	Zawyet Razim–Kom Gi'eif	41
Naucrati–Melcati	32	Kom Gi'eif–[location unknown]	X
IN TOTAL	135	IN TOTAL	92+X

It has been noted that the *Peutinger Map* often omits certain stations and distances; unsurprisingly, it is also true for the Alexandria–Memphis road. According to the *Table*, the road from Memphis did not lead to Alexandria proper but terminated at an otherwise unknown and as-yet-unidentified site of Melcati.⁶⁹

6.1.3. Maryut–Wadi Natrun trails (Map 11)

De Cosson surveyed the area northwest of Wadi Natrun and mapped a web of minor trails that radiated northwards from Wadi Natrun/Sketis, linking the natron valley to neighbouring monastic communities and, indirectly, to Mareotic Lake. One such trail struck northwest from Wadi Natrun and went past sites of al Zawya (well), Alam Shalut, and Abu Menas (a large Christian community and a prosperous Late Roman town serving the pilgrims), to reach Mareotic Lake near modern Bahig.⁷⁰ Another trail left Wadi Natrun and veered off in a more westerly direction, passing by Khasm al Khaud (a remote monastery) and Qasr al Qatagi (a Late Roman chapel and pilgrim resting-place). Further on, the trail turned north and struck for wells at Sidi Abd al Ati and al Hamman; at the latter location, the trail approached Mareotic Lake and converged with the road I previously termed the Qassabat run.⁷¹ So far, no traces of Roman-era traffic have been detected on these trails. Future surveys in the area will hopefully uncover more data before the ongoing urban sprawl obliterates these faint pathways.

6.2. Roads between Memphis and selected Western Desert sites

Memphis (modern Manf), an ancient city situated about 20 kilometres south of modern Cairo, was the terminus of many desert roads that linked it to Wadi Natrun, the Fayum, and other sites in the Western desert. Travellers between Memphis and Wadi Natrun could either make a detour through Kom Abu Billo (ancient Terenuthis) or directly brave the desert between Wadi Natrun and Giza. In turn, another road running next to Pepi II's pyramid in Saqqara soon forked, with one arm proceeding west and disappearing in the sands of the desert and another one turning southwest and striking for the Fayum, both roads sided with stelae/road markers.

6.2.1. Memphis–Wadi Natrun roads (Map 11)

A valley of bitter lakes, Wadi Natrun region in the northeastern part of the Western desert, was famous mainly for its natron deposits; ancient Egyptians greatly valued this astringent mixture of sodium carbonate and sodium bicarbonate, using it for mummification, cleaning, and glassmaking.⁷² In the Late Roman period, the Wadi Natrun area rose in importance for Christians. Three locations in Wadi al-Natrun valley, known as Sketis (Σκήτις), Nitria (Νιτρία), and Kellia (Κελλία), were settled by a group of eremites subsequently known as Desert Fathers. Their renowned piousness in due course attracted other Christians wishing to develop spiritual selfdiscipline in the desert solitude.⁷³ Newcomer eremites sought isolated places where they could settle; in time, they established numerous minor communities around Wadi Natrun, all linked by a criss-crossing web of desert trails.

Two trails linked Wadi Natrun to the Alexandria–Memphis track.⁷⁴ The first one originated at ancient Terenuthis (Egyptian Mefkat),⁷⁵ a village identified with modern Kom Abu Billo, most recently excavated by a joint team of the French Institute of Oriental Archaeology and the University of Lille. A sprawling site by the Canopic Nile, Kom Abu Billo abounds in Ptolemaic and Roman pottery shards. Although it was continuously occupied from the Old Kingdom well into the Arabic period, its prime began in the Roman era, when the town's inhabitants engaged in the roaring riparian trade, profiting from Terenuthis' closeness to Alexandria.⁷⁶ Digs unearthed numerous Graeco-Roman shrines, a Dynastic/Graeco-Roman necropolis, and an extensive urban district. Significantly, some finds in the Graeco-Roman tombs at the site indicate Terenuthis traded in salt gathered in the vicinity of Wadi Natrun.⁷⁷ The natron trail left the town and ran southwest for about 24 kilometres (ca. 15 Roman miles) before reaching Wadi Natrun. As such, it was the shortest and most direct crossing between the natron land and the Nile Valley.⁷⁸ An alternative access track left Wadi Natrun and proceeded southeast into Wadi al-Farigh, where it turned east, followed Wadi Qara, and probably joined the Alexandria–Memphis road at Abu Rawash, near the ruined pyramid of Djedefre.⁷⁹ This road, the southern section of the trail called Darb al-Hagg al-Magharbe, was much travelled in the Dynastic period; probably, it was the trail that Sinuhe followed ca. 2000 BCE when fleeing the country.⁸⁰ It has been argued that the Wadi Natrun track might have actually struck even further south, eventually connecting with the Dashur road,⁸¹ however, recent surveys have not discovered any traces of that connection.

6.2.2. 'Dashur' road (Map 12)

Two roads radiated from Memphis and crossed the Western Desert. The first, the so-called Dashur road (although it does not come close to the town), was first surveyed by Flinders Petrie and then by Hans Goedicke and Mounir Basta.⁸² Bordered by windrows heaped out of surface rubble,⁸³ the road left Memphis near the pyramid of Pepi II and proceeded westwards for ca. 23 kilometres before disappearing in the sands of the desert.⁸⁴ Significantly, the windrows were spaced 25 metres apart, an extraordinary width for an Egyptian desert road.⁸⁵ Caton-Thompson, Gardner, and Graeff argue the breadth of the road was directly related to its function. In their view, it was an

access road to Old Kingdom quarries at Umm es-Sawan (gypsum) and Widan al-Faras (dolerite) from which stones were hauled eastwards along the road to the pyramid building sites near Dashur.⁸⁶

It appears this road was used well into the Late Period and perhaps later. Altenmüller and Moussa surveyed the road's eastern end in 1977 and discovered a stela inscribed for 25th Dynasty Libyan king Taharqa, demonstrating the area saw a measure of traffic in that period.⁸⁷ In turn, Goedicke and Basta's surveys along the track unearthed six stelae buried in spots along the road. Five of them bore cartouches of Psammetichus I (26th Dynasty), with four undamaged enough to preserve the text commemorating the king's victory over the invading Libyan tribes.⁸⁸ Basta affirms they were placed along the road as propaganda pieces. Later, they were purposefully overturned and buried in sandpits beside the road, perhaps – in Basta's view – by Libyans, who wished to obliterate traces of their former defeat.⁸⁹ Graeff connected the Old Kingdom use of the road for stone transport to its Late Period use for military expeditions, also taking into account the presence of ruined stone buildings at the road's sudden end at the 23rd kilometre. In his view, the ruined building at the end of the road used to be an Old Kingdom military fort that guarded and supplied quarries at Umm es-Sawan and Widan al-Faras; with the end of the 6th dynasty, the quarries were abandoned, the access roads to them fell into disrepair, and eventually, they disappeared. In contrast, the military fort was reoccupied in the Late Period to supply soldiers guarding the area against Libyans; accordingly, the 23-kilometre main road leading to the camp was refurbished and adorned with celebratory stelae, the remains of which were found by Goedicke and Basta.⁹⁰

Of particular interest to this study is the third stela of Psammetichus I, located 8 kilometres west of the pyramid of Pepi II in Dashur. In the Ptolemaic or Roman period, a man called Nikostrates carved his name on that stela; Wagner argues this inscription proves the Dashur road in some way connected to the trail leading to Siwa and the road was travelled in the Graeco-Roman period.⁹¹ Most surveyors concur with Wagner in that matter; for instance, Lisa Giddy plots on her map a putative road linking Wadi Natrun to Dashur.⁹² It is true that Nikostrates' inscription testifies to a modicum of Graeco-Roman traffic on the Dashur road, but, due to the aforementioned disappearance of the road after 23 kilometres, one cannot predict to where exactly Nikostrates travelled. Graeff and Basta convincingly demonstrated that Dashur road in its 26th Dynasty form ran only as far as the aforementioned ruins of a military fort. No known trail links the end of the Dashur road to Wadi Natrun or any other road leading to Siwa. In conclusion, the oft-asserted existence of such connecting trails should be corroborated by ground checks and surveys before such trails are plotted on maps of the region.

6.2.3. *Memphis/Saqqara-Fayum (Map 12)*

The second road that radiated out of Memphis diverted from the previously discussed quarry track (6.2.2) and veered southwest, heading towards the northwestern point of the Fayum Oasis; similarly to its coterminous trail, it was surveyed by Flinders Petrie in 1887. The Memphis-Fayum road was bordered by two parallel windrows of flint chips

set about 4.10 metres apart.⁹³ Surveying the road edges, Petrie discovered weathered remains of milestones: limestone blocks with pillar sockets cut in tops, spaced along the trail in regular intervals.⁹⁴ Having measured the intervals between the limestone markers, Petrie concluded they were based on a variant of a Ptolemaic *schoinos* (ca. 6.31 kilometres) and argued the road must have been built after the Greek conquest of Egypt.⁹⁵ The subsequent discovery of the Taharqa stela near the convergence of Dashur and Fayum trails challenged Petrie's dating. The stela text commemorates cavalry exercises overseen by Taharqa, which entailed a horse race from Memphis to Fayum and back; hence, the road must have been in use under the 25th Dynasty, if not before.⁹⁶ Graeff collects all pieces of evidence and concludes the direct crossing between Memphis and Fayum was made at least since the Old Kingdom period; however, the trail had to be periodically rerouted due to the shifting sand dunes that covered up road windrows. The Ptolemaic run of the road, marked by conspicuous road signs, was probably built to accommodate the growing traffic between Memphis and the newly settled villages of Kom Aushim (Karanis) and Kom al-Atl (Bakchias) at the northwestern tip of the Fayum Oasis; as the best and shortest crossing, it must have been used well into the Roman period.⁹⁷ Unfortunately, the trail tracks and limestone markers uncovered by Petrie have been obliterated by modern developments in the area.⁹⁸ Perhaps, future surveys and advances in satellite photography will allow researchers to uncover further traces of road stations along this track.

6.3. Roads from Siwa to the Mediterranean coast and the Nile Valley

It has been repeatedly stated that links between Siwa Oasis and the Nile Valley are loose at best, with significant differences in culture, social structure, and language spoken.⁹⁹ Geographical location of Siwa contributes to its relative apartness. Situated in the northwestern portion of the country close to the Libyan border, Siwa is separated from the Nile Valley by the forbidding Qattara Depression,¹⁰⁰ stretching to the east of the oasis. Easily reachable from Libya and the coast of the Mediterranean, Siwa has almost no routes linking it directly to the Valley.¹⁰¹ Conversely, there were several ancient roads linking the Siwan district to the shore, passing through the Marmarica Plateau.

The desert archaeology in the region has special concerns. Few traces of ancient roads were preserved on the face of the Marmarica desert; accordingly, the scholars studying these trails chiefly rely on historical maps of the region and on archaeological surveys of sites suspected to be ancient road stops.¹⁰² Recent findings of the Eastern Marmarica survey indicate this arid region received too little precipitation for unirrigated subsistence agriculture. Even the coastal sites rarely get more than 100 mm of annual rainfall, whereas inland sites of Central Marmarican Plateau can receive 35 mm/year or less, with hyper arid Siwa receiving merely 8 mm/year.¹⁰³ In response to unfavourable climatic conditions and poor calcareous soils, ancient inhabitants of Marmarica developed extensive water and soil harvesting systems, systems so

effective that the farms irrigated by them eventually produced surplus yields. Recent surveys by the Eastern Marmarica survey team indicate water harvesting techniques were locally used in the New Kingdom period (1550–1070 BC), but their most widespread and sophisticated use dates to the Graeco-Roman period.¹⁰⁴ Ongoing surveys in the Marsa Matruh (Paraetionium) region demonstrate the farms situated in the coastal and pre-desert zone of Marmarica thrived under the Roman rule, their embanked fields (*kurum*) yielding copious quantities of barley, grain, figs, olives, and grapes; surplus produce was then traded with neighbouring oases, Alexandria, ancient Cairo, and Cyrene, with profits contributing to the economic growth in the Marmarica region.¹⁰⁵

In the hyper arid central Marmarica Plateau, water harvesting installations could not yield enough water to sustain agriculture, but they stored enough moisture to satisfy travellers crossing this inhospitable region.¹⁰⁶ Surveying the stretch of the desert between Marsa Matruh and Qara Oasis, Thomas Vetter, Anna-Katharina Rieger, and Heike Möller noticed remains of several hundred cisterns dotting the Marmarica Plateau, hewn into the limestone bedrock and often abutting ancient ruins.¹⁰⁷ The cisterns could not be dated, but pottery shards found in their context were dated to a period ranging from the 6th century BCE to the 10th century CE, with the majority of shards coming from Early and Late Roman vessels.¹⁰⁸ The abundance of Roman remains on the cistern sites demonstrates the Eastern Marmarica in the Roman period was a busy transition zone, with a crisscrossing web of trails traversing this arid plateau and linking Siwa Oasis and Qattara Depression to Catabathmus Maior, Paraetionium, and the shores of Mareotic Lake.¹⁰⁹ Puzzlingly, many ancient literary sources stated the Western Desert and The Marmarica Plateau in particular were some of the most barren and hostile spots in the oikumene, braved only by the most determined travellers;¹¹⁰ granted, this hyper arid centre of the Central Marmarica Plateau had fewer cisterns than the lands closer to the Mediterranean, but there were enough cisterns and natural waterholes to make a safe crossing.¹¹¹ Having meticulously plotted ancient water harvesting/storing installations on the Central Marmarican Plateau, Vetter, Rieger, and Möller provided evidence that Graeco-Roman cisterns were often ‘focal points of desert transit’; in the dried areas, they lined trans-regional north–south routes and supplied caravans with water.¹¹² Preliminary analyses of diachronic spread of pottery shards at surveyed sites have yielded intriguing results. In time, it will probably be possible to observe which trails were preferred in specific time periods.¹¹³

6.3.1. *Masrab al-Muhashas (Siwa Oasis–Wadi Natrun–Manf/Memphis [?])* **(Maps 11, 12, 13)**

The only road that directly connected Siwa to the Nile Valley was *Masrab al-Muhashas*, which ran eastwards, meandered in the shade of the northern Qattara Depression escarpment, skirted the northern edge of alkali lakes of Wadi Natrun, and struck towards Memphis.¹¹⁴ About 3000 stadia in length along the track, the

road was travelled in about 12 days in Pliny's time.¹¹⁵ Masrab al-Muhashas is chiefly known as the track Alexander the Great might have taken when returning from Siwa to the Nile Valley.¹¹⁶

Leaving the Siwan village of Aghurmi, Masrab al-Muhashas first strikes more or less north-east-north for 130 kilometres, circumventing salt marshes by the Siwan villages of Aghurmi and al-Zaytun, then it turns north towards the poorly surveyed Roman site of Timeira and finally enters the small Oasis of Qara (Gara), also known as al-Qara or Qara Umm al-Sughayyar.¹¹⁷ The oasis has been customarily identified with Ptolemy's site of Siropon¹¹⁸ or, alternatively, with 'Alexander's Camp' (Alexandrou Parembolē).¹¹⁹ Surface finds of imperial Roman coins and amphorae imply this remote waterhole could have been at least periodically occupied in the Roman period, but no thorough archaeological work has been done in the area.¹²⁰

An important desert trail crossing, Qara is the spot where Masrab al-Muhashas meets other tracks that veer seawards towards Marsa Matruh and Garawla.¹²¹ The trail leading to Garawla (east of Marsa Matruh), Masrab Khalda, passes a group of wells (Bir Abu Shayit, Bir Khalda, Bir Abu Mukhayat) in the vicinity of which surveys uncovered Ptolemaic remains. Chronological distribution of pottery pieces suggests that Masrab Khalda lost some importance in the Roman period, with Masrab al-Istabl becoming a preferred connection between Siwa and Paraetonium.¹²²

After Qara, the road towards Memphis bifurcates into two tracks running parallel for several hundred kilometres. The northern branch, Masrab al-Dara, hugs the escarpment of Qattara Depression, running by several intermittent springs. The southern, more direct trail – Masrab al-Muhashas proper – crosses salt flats (*sebkhas*) of the Qattara Depression, only to join its northern branch not far from Lake Moghra (Heteyet al-Moghara).¹²³ There are other smaller branches parallel to these two, some ascending onto the northern escarpment; Masrab al-Dara was probably the most frequented one, as it passes by the most abundant water sources.¹²⁴ At Matan Frayn, just west of Lake Moghra, a minor pathway separates from the main road and strikes northwards to Marina al-Alamein.¹²⁵ Ball followed this trail, travelling from al-Alamein through al-Qassabat al-Gharbiya to Minqar Abu Dweis hill north of the Qattara Depression and gave its length as 65 kilometres; Kuhlmann speculated this might have been the route Siwan bandits followed to raid the Alexandrine district.¹²⁶ Masrab al-Muhashas then circumvents Moghra, a mosquito-infested brackish lake bordered by rugged cliffs to the north and spreading sand dunes to the south.¹²⁷ East of the lake, Masrab al-Muhashas bends around the northern edge of Wadi Natrun alkali lakes and joins other trails that lead to the Nile Valley villages of Terenuthis and Abu Rawash.¹²⁸ Many scholars asserted that travellers on Masrab al-Muhashas would cross Wadi Natrun and strike southeast to follow the Dashur road and make a direct crossing to Memphis,¹²⁹ but surveys on the Dashur road have not uncovered traces of any trails that would link the Dashur road to Masrab al-Muhashas or to Wadi Natrun.¹³⁰

Map 13 – Marmarica, Siwa Oasis, and Qattara Depression

Found in the remote northwestern corner of Egypt, the Siwa Oasis tends to gravitate towards Libya and the coast of the Mediterranean Sea instead of the Nile Valley and other Egyptian oases. Traffic between Egypt and Siwa must navigate rough terrain to the east and south of the oasis. To the east of Siwa stretches the forbidding Qattara Depression, an expanse of treacherous salt flats (*sebkhas*) with no potable water sources. To the south rises the Great Sand Sea, a labyrinth of waterless shifting dunes. Only two Siwan trails brave these regions. A road known as MASRAB AL-MUHASHAS strikes east and links the main Siwan settlement of Aghurmi (*Ammonos Hieron*) to Wadi Natrun (*Sketis/Skete*), and, possibly, to Manf (*Memphis*); some believe this is the road taken by Alexander the Great when he was returning from Siwa to Egypt. Upon reaching the Qattara Depression, Masrab al-Muhashas passes by the oasis of Qara (*Siropon?/Alexandrou Parembolē?*) and briefly bifurcates into two parallel tracks. The northern branch, Masrab al-Dara, hugs the escarpment of the Qattara Depression, whereas the southern branch – Masrab al-Muhashas proper – crosses the salt flats of the depression to re-join its sister branch not far from Lake Moghra. Ancient traffic probably preferred the Masrab al-Dara branch, with better access to water and shelter. Between Siwa and Qara, the Roman-era traffic is certain; between Qara and Wadi Natrun, it is unconfirmed but likely; between Wadi Natrun and Memphis, it remains unconfirmed. To the southeast of Siwa, an ancient route (DARB AL-BAHARIYA) ran to Bahariya via the al-A'reg oases cluster, where traces of Graeco-Roman settlements have surfaced; Darb al-Bahariya was probably used only infrequently under the Romans, owing to rough terrain, marshes, and salt pans on the road.

To the north of Siwa spreads the Marmarican Plateau, an inhospitable hyper arid upland that rises gradually from the shore of the Mediterranean and then plunges sharply into the depths of the Qattara Depression. Surprisingly, the Plateau appears to have been a busy transition zone under the Romans, with a web of trails across it linking the oases of Siwa and Qara and the Qattara Depression to sites at the Mediterranean, including Sallum (*Catabathmus Maior*), Marsa Matruh (*Paraetonium*), and the Maryut. Surveys of the Plateau uncovered extensive ancient water-harvesting installations – most prominently, the remains of several hundred cisterns, hewn into the limestone bedrock and often abutting pottery heaps, the majority of shards from these heaps coming from Early and Late Roman vessels. Judging from pottery assemblages, Roman-era traffic is confirmed on MASRAB AL-ISTABL (Marsa Matruh → Aghurmi) and MASRAB KHALDA (Marsa Matruh | Garawla → Qara → Aghurmi), and likely on MASRAB DIQNASH (Sallum → Aghurmi) and MASRAB AL-QATRANI (al-Bisri → Aghurmi).

Maps and materials consulted: de Cosson 1935, *passim*, 106–107, 115–116, 130, 135–157; Oliver and de Cosson 1938, 162–175; Fakhry 1973, 14–15; Giddy 1987, 17–18, 36, map 1; Kuhlmann 1988, 170; 2013, 147–148; Barrington Atlas (ed. Talbert 2000), maps 73, 74; Graeff 2000, 17, 26–27, 35–37, maps VI, VII, XVI; Szymańska and Babraj 2007, 161–162; Vetter, Rieger and Möller 2013, 461, 469, fig. 13, 477, fig. 23.

MARMARICA COASTAL ROAD (ALEXANDRIA–SALLUM/LIBYA) (section 6.1.1): Alexandria → Abu Sir (*Taposiris Magna*) (not depicted) → al-Bordan (*Cheimo*) → al-Imayid (*Halmyra?*) → Marina al-Alamein

(*Antiphras?*) → Derasiya (*Derras*) → Sidi Abd al-Rahman (*Comaru?*) → al-Dab'a (*Caportis?*) → Marsa Abu Samra (*Pedonia?*) → al-Gotta (*Pnigeus?*) → Garawla → Marsa Matruh (*Paraetionium*) → Zawiyet Umm al-Rakham (*Apis*) → Marsa Baqqush (*Zygris*) → al-Bisri → Marsa Bomba (*Ainesisphyra*) → Sallum (*Catabathmus Maior*)

QASSABAT RUN (MARYUT–MARINA AL-ALAMEIN) (section 6.1.1): Hawariyya (*Marea*) (not depicted) → al-Qassabat al-Gharbiya (*Monocaminum?*) → [road link to Marina al-Alamein and Matan Frayn] → [joins the Marmarica Coastal Road]

MASRAB AL-MUHASHAS (SIWA–MANF?) (section 6.2.1/section 6.3.1): Aghurmi (*Ammonos Hieron*) → al-Zaytun → Timeira → Qara (*Siropon?/Alexandrou Parembolē?*) → Matan Frayn → [side track to Marina al-Alamein diverges] → Lake Moghra → Wadi Natrun (*Sketis/Skete*) (not depicted) → Manf (*Memphis?*)

SIWA–BAHARIYA ROAD (DARB AL-SIWA/DARB AL-BAHARIYA) (section 6.9.1.1): Aghurmi (*Ammonos Hieron*) → al-Zaytun → al-'Areg (not depicted) → Sitra (not depicted) → Bawiti (*Psobthis?*) (not depicted)

MASRAB AL-ISTABL (MARSATRUH–SIWA) (section 6.3.2): Marsa Matruh (*Paraetionium*) → Abar al-Kanayis → Aghurmi (*Ammonos Hieron*)

MASRAB KHALDA (MARSATRUH | GARAWLA–QARA–SIWA) (section 6.3.2): Marsa Matruh (*Paraetionium*) | Garawla → [branches merge] → Qara (*Siropon?/Alexandrou Parembolē?*) → Timeira → al-Zaytun → Aghurmi (*Ammonos Hieron*)

MASRAB DIQNASH (SALLUM–SIWA) (section 6.3.3): Sallum (*Catabathmus Maior*) → Aghurmi (*Ammonos Hieron*)

MASRAB QATRANI (AL-BISRI–SIWA) (section 6.3.3): al-Bisri → Aghurmi (*Ammonos Hieron*)

6.3.2. Sultan's Road (Siwa Oasis–Marsa Matruh) (Map 13)

The more significant Siwan road is undoubtedly the trail linking Paraetionium (modern Marsa Matruh) to Siwa, today known as Masrab al-Istabl.¹³¹ About 300 kilometres long, this was the track taken by Alexander the Great when he travelled to the Oracle of Ammon in Siwa in 331 BCE.¹³² Once covered by camels in 8–9 days,¹³³ the road has since been macadamised, but it still follows ancient caravan tracks.¹³⁴ Many travellers on the trail noted a great number of ancient cisterns dotting the landscape between Marsa Matruh and Siwa;¹³⁵ recent surveys by Vetter, Rieger, and Möller proved these cisterns were part of a Roman road installations system that supplied travellers in the region with water.¹³⁶

Leaving Marsa Matruh, Masrab al-Istabl first crosses the fertile coastal plain, passing a line of unsurveyed water cisterns at Bir Harash, Bir Hukuma, and Bir Salihat.¹³⁷ Sixty-five kilometres from Marsa Matruh, one arrives at Abar al-Kanayis, probably the best studied desert road site in the region. The site comprises two cisterns (surrounded with faint traces of fields) and the ruins of a spacious two-storeyed rectangular edifice built of limestone blocks and mud bricks.¹³⁸ Current excavations by the Eastern Marmarica survey team demonstrated the building in

question was occupied from the 3rd century CE to the 6th century CE; it burned down and collapsed at some point in the 6th century CE, to be partially restored and reoccupied for a short time in the 6th century CE and ultimately abandoned at the end of that century.¹³⁹ The excavators tentatively ascribe the building's destruction to Libyan raids that laid waste to Marmarica in the Late Roman period.¹⁴⁰ The edifice probably served as a roadhouse for ancient travellers progressing along Masrab al-Istabl,¹⁴¹ with excavators of the site drawing interesting parallels between the Abar al-Kanayis building and Roman *hydreumata* found in the Eastern Desert. Roman road stations in the Eastern desert usually drew water from deep wells dug inside the forts, whereas Marmarican water installations gathered runoff surface water from large areas, and accordingly, they could not be confined within buildings or fortifications.¹⁴² Such differences in structural design of desert road stations showcase Roman adaptability to varying climatic and topographic conditions in the deserts of Egypt.

Following south-south-west from Abar al-Kanayis, the road passes three wells (Bir Emtiha, Bir Hilw, Bir Fuad), where members of the Eastern Marmarica survey team found pottery assemblages dated to Early and Late Roman periods.¹⁴³ 160 kilometres from Marsa Matruh, Masrab al-Istabl comes to a water cistern at Bir Nuss,¹⁴⁴ abounding in pottery shards of the Roman period, with a possible admixture of earlier fragments. The main road strikes southwards and, after wending its way past an unsurveyed cistern at Bir al Basur, it enters Siwa through one of the cliff passes.

At least two alternative trails paralleled Masrab al-Istabl, linking Paraetionium to Siwa Oasis. Masrab Khalda, discussed in the section on Masrab al-Muhashas, separated from the Memphis-bound trail in Qara and turned north-east-north, passing a group of wells (Bir Abu Shayit, Bir Khalda, Bir Abu Mukhayat), where Ptolemaic pottery assemblages were found. Approaching the coast, Masrab Khalda bifurcated into two trails, one leading to Marsa Matruh (Paraetionium) and another to Garawla.¹⁴⁵ Eastern Marmarica surveyors found another trail wending its way between Masrab Khalda and Masrab al-Istabl. This as-yet-unnamed track left Paraetionium and ran southwards by cisterns at Bir Quseir and Bir al Naga/Bir Qasir al Sirr, where surveys uncovered pottery remains from a period between the 6th century BCE and the Late Roman age; further south, the trail split into several pathways that converged with Masrab Khalda and Masrab al-Istabl.¹⁴⁶ Remains at surveyed cistern sites imply (but do not confirm) Masrab Khalda was travelled chiefly in the pre-Roman period, and Masrab al-Istabl gained in popularity only after the Roman conquest; in contrast, the unnamed trail between them saw a measure of traffic in both epochs.

6.3.3. *Masrab Diqnash (Siwa Oasis–Sallum) (Map 13)*

It could be argued that there was another ancient trail about 310-kilometres-long that linked the shore to Siwa Oasis, that is, Masrab Diqnash, between Siwa and Sallum (Catabathmus Maior).¹⁴⁷ Leaving Catabathmus Maior, Masrab Diqnash first struck

Table 6.5 Sites on/near Masrab al-Istabl: Marsa Matruh (Paraetonium)–Siwa

Waypoint	Interval (km)	Remarks	Frequentation	
			Pre-Roman	Roman/Byzantine
Marsa Matruh	30	–	X	X
Bir Harash		–	–	–
Bir Hukuma	6	–	–	–
Bir Salihat	6	–	–	–
Abar al-Kanayis	15	–	–	–
Bir Emtiha	10	surveyed	X	X
Bir al Gellaz	8	surveyed	–	X
Bir Hilw	12	–	–	–
Bir Istabl	15	surveyed	–	X
Bir Fuad	30	surveyed, no pottery collected	–	–
Bir al Nuss	30	surveyed	–	X
Bir al Basur	42	surveyed	X	X
Siwa	92	–	–	–
			X	X

(Total distance 296 km, table after Vetter, Rieger, and Möller 2013, 478–479, figs 22, 23.)

southeast until it came to the ascent to Marmarica Plateau; the trail turned sharply south and ran straight for many kilometres before descending into the Siwan valley.¹⁴⁸ No literary testimonies demonstrate it was used in the Roman period; however, some archaeological remains in the vicinity of this trail still await proper excavation and dating. Dalrymple Belgrave noted a number of old rectangular underground cisterns for catching rainwater at the waystations close to the sea; usually 40 feet square by 20 feet deep with two rectangular shaft openings to access water, most of these cisterns were in varying states of disrepair.¹⁴⁹ Two of the places where such water storage facilities were found were Bir Augerin and Bir Hamed, next to Masrab Diqnash.¹⁵⁰ In his work, Belgrave quoted M. Maspero, according to whom these ‘cisterns [...] were built by the Romans in the second century A.D., and were in use until the middle or end of the fourth century’.¹⁵¹ Maspero’s appraisal has been proven correct. These cisterns, a subtype of Graeco-Roman *lakkoi*, were found to be common in Marmarica

Table 6.6 Sites on/near Masrab Khalda: Garawla (near Paraetonium)–Siwa

Waypoint	Distance (km)	Remarks	Frequentation	
			Pre-Roman	Roman/Byzantine
Garawla	19	–	–	–
Bir ‘Ali al Qadi		–	–	–
Bir Abu Shayit	19	surveyed	X	X
Bir Talab	7			
Bir Abu Salid	5	–	–	–
Bir Khalda	9	–	–	–
Bir Abu Mukhayat	18	surveyed	X	–
Hisy Tartura	45	surveyed	X	–
Qara	90	natural spring	–	–
Siwa	114	oasis	–	–
		–	X	X

(Total distance 326 km, table after Vetter, Rieger, and Möller 2013, 478–479, figs 22, 23.)

and probably belong to the same type as ones adjoining desert roads of Masrab Khalda and Masrab al-Istabl.

It is worth mentioning at this point that two other ancient trails flanked Masrab Diqnash from the east. Masrab al Khamsa left from Sidi Barrani (Anesiphya) and struck for Siwa, bypassing cisterns of Haqfet al ‘Inaba, Bir al Thalatha, Bir al Khamsa, and Bir Basur. In turn, Masrab al Qatrani linked Siwa to a place east of Sidi Barrani, named al Bisri. The road wended its way by cisterns of Bir al Thamayil, Bir Husein, and Bir al Qatrani.¹⁵² Both tracks have not been thoroughly researched; future surveys in the area will undoubtedly uncover more traces of ancient roads in the region to be dated through pottery shard assemblages.

6.4. Roads from Bahariya Oasis to the Nile Valley

Roads radiating from Bahariya to the Valley could either strike northeast or east. Darb al-Rayan links Bahariya to ancient sites of Dionysias and Tebtynis in the Fayum, whereas Darb al-Qahira connects Bahariya to Giza – although it is not known whether it was travelled in the Antiquity. The main Bahariya–Nile Valley road, however, was the Bahariya–Oxyrynchus (al Bahnasa) road, which linked the oasis to its administrative capital.

6.4.1. Roads from Bahariya Oasis to Fayum and beyond (Map 14)

Several trails radiate northwards and eastwards from Bahariya, linking it to sites in the Fayum and the Nile Valley. The ancient track connecting the ancient Bahariya to Fayum proper, Darb al-Rayan, runs for 240 kilometres and can be travelled in about 5 or 6 days by a camel.¹⁵³ Darb al-Rayan is slightly more demanding than the even and straight trail between Oxyrynchus and Bahariya (Darb al-Bahnasawi), as it traverses rough, uneven terrain around the northern end of the Ghard Abu Muhariq dune chain; nonetheless, it was still frequently travelled in the Antiquity.¹⁵⁴

Darb al-Rayan strikes northeast from Bahariya's main settlement, Bawiti (sometimes identified with ancient Psobthis), towards a conspicuous summit of Gebel Ghorabi hill, where the road splits into several minor tracks. The northern trail branch follows north to the Nile Valley villages near Giza. The eastern branch, Darb al-Rayan proper, veers east-north-east and wends its way through treacherous dunes of Ghard Abu Muhariq. The trail periodically bifurcates while going ahead, with the northern arm appropriately called Darb al-Rayan Bahari (*Bahari* – 'northern' in Arabic) and the southern one Darb al-Rayan Qibli (*Qibli* – 'southern' in Arabic).¹⁵⁵ Two parallel tracks eventually arrive at Wadi Rayan wells/grazing grounds, where they diverge.¹⁵⁶ The northern trail passes by the Ain al-Rayan al-Bahariya well, where shards of Roman pottery and ruins were found; it subsequently veers north to Qasr Qarun (Dionysias) and Watifa (Philoteris) in the western Fayyum, where excavators have uncovered remains of a caravan customs station and Diocletianic military forts.¹⁵⁷ In contrast, the southern track passes the Ain al-Rayan al-Qibli spring and continues east towards Gharaq Sultani in the southern Fayum, where sites of Umm al-Baragat (Tehtynis) and Ihnasya al-Medina (Heracleopolis Magna) are located.¹⁵⁸ The ruins in Wadi Rayan hollow indicate the region was once densely inhabited in the Roman period. Unfortunately, the buildings were being rapidly destroyed in the 1940s by illicit treasure seekers, the majority of still-standing walls stripped down to their foundations;¹⁵⁹ it remains to be seen whether future excavations will be able to uncover remaining traces of Roman habitation.

Several pieces of evidence hint at this trail being travelled in the Graeco-Roman period. Wandering along Darb al-Rayan during his Libyan treks, Steindorff discovered ruins he tentatively dated to the Roman period; unfortunately, they have not been surveyed since his visit.¹⁶⁰ More significantly, the military fortifications and customs house at Dionysias point to the town having been important for movement of goods out of and into the Fayum; their construction at such a spot would make sense only if a commercially significant trade road passed near them. Preserved trade papyri testify that the people of the Fayum and the Oasites regularly traded in foodstuffs and desert commodities such as alum.¹⁶¹ Regrettably, receipts recording exchange of goods between the Fayum and 'the Oases' often do not specify which Oasis they mean;¹⁶² nonetheless, it can be safely assumed that many goods Fayum exported to 'the Oases' were meant for the closest one, Bahariya, and travelled along this direct Bahariya-Fayum link.

Another trail, Darb al-Qahira, was believed to link Bahariya to Giza; running over 300 kilometres over rough gravel and desolate dunes, it enters the Nile Valley in the area of modern Kirdasah and can be covered in 9 or 10 days by a camel.¹⁶³ Paved in the 1960s, Darb al-Qahira today stands for the main artery linking the capital to the oasis.¹⁶⁴ The road originates in Bawiti (Psobthis?) and strikes north towards the oasis escarpment, passing the 'Ain al-Bahariya spring, the only reliable water source along the entire length of this road.¹⁶⁵ Exiting the oasis, the road veers around the Gebel Ghorabi hill and transects a chain of sand dunes (Ghard Abu Muhariq) that stretch from the northern tip of Kharga to the point northeast of Bahariya. Difficult to cross even for camels, the dunes have damaged many an early car attempting to pass through them.¹⁶⁶ Traversing monotonous, waterless gravel flats, Darb al-Qahira steadily strikes northeast and eventually comes to Gebel Hamid, a conspicuous ironstone mountain situated 60 kilometres from Giza; subsequently, the road veers east-north-east and arrives at modern Kirdasah in the vicinity of Giza.¹⁶⁷

No clear consensus exists on whether Darb al-Qahira was travelled in the Antiquity. Having surveyed the track in the 1930s, Cuviller reported no cairns or road markers, instead commenting upon the extreme remoteness and barrenness of the traversed area.¹⁶⁸ An indefatigable surveyor of the Western Desert, Fakhry believed Darb al-Qahira sits atop an ancient caravan track, traces of which obliterated by countless tyre tracks, but he presented no evidence to support his hypothesis.¹⁶⁹ Wagner, strongly focused on epigraphic evidence for desert travel, omitted Darb al-Qahira from his description of Graeco-Roman trails surrounding the Bahariya Oasis.¹⁷⁰ The most recent surveyor of these tracks, Graeff rejected Fakhry's hypothesis and demonstrated that a trail leading through such a demanding and waterless waste could be travelled only with the greatest effort; caravans going from Memphis to Bahariya would probably pick the well-provisioned route through Fayum, instead of first making a detour to Kirdasah and only then turning southwest to follow this desolate road.¹⁷¹ It is difficult to imagine why an ancient caravan from Memphis would willingly follow a waterless trail for 300 kilometres, if one could travel through well-watered districts of Fayum and Wadi al-Rayan. An ancient equivalent of Darb al-Qahira might have occasionally been travelled but only in very extreme circumstances.

6.4.2. Bahariya Oasis–Oxyrynchus road (Darb al-Bahnasawi) (Map 14)

The most significant route between Bahariya and the Valley, 190-kilometres-long Darb al-Bahnasawi connected the Oasis to al-Bahnsa (Oxyrynchus); made in 4 days with camels, this convenient crossing was used from the Dynastic period until the 1930s, when Darb al-Qahira slowly gained in popularity.¹⁷² Radiating east from Bawiti (Egyptian Psobthis), Darb al-Bahnasawi gradually ascends the escarpment surrounding the oasis, wending its way by the al-Harra spring, the site abundant in ruins and remains from the Roman period.¹⁷³ Having left the Oasis, the trail strikes almost directly east, bypasses the Ischouab hill, and then branches out before reaching the Nile Valley.¹⁷⁴ Upon approaching the city, travellers went through the so-called Libyan Gate (πύλη Λιβική, *Pyle Libike*) and entered Oxyrynchus proper.¹⁷⁵

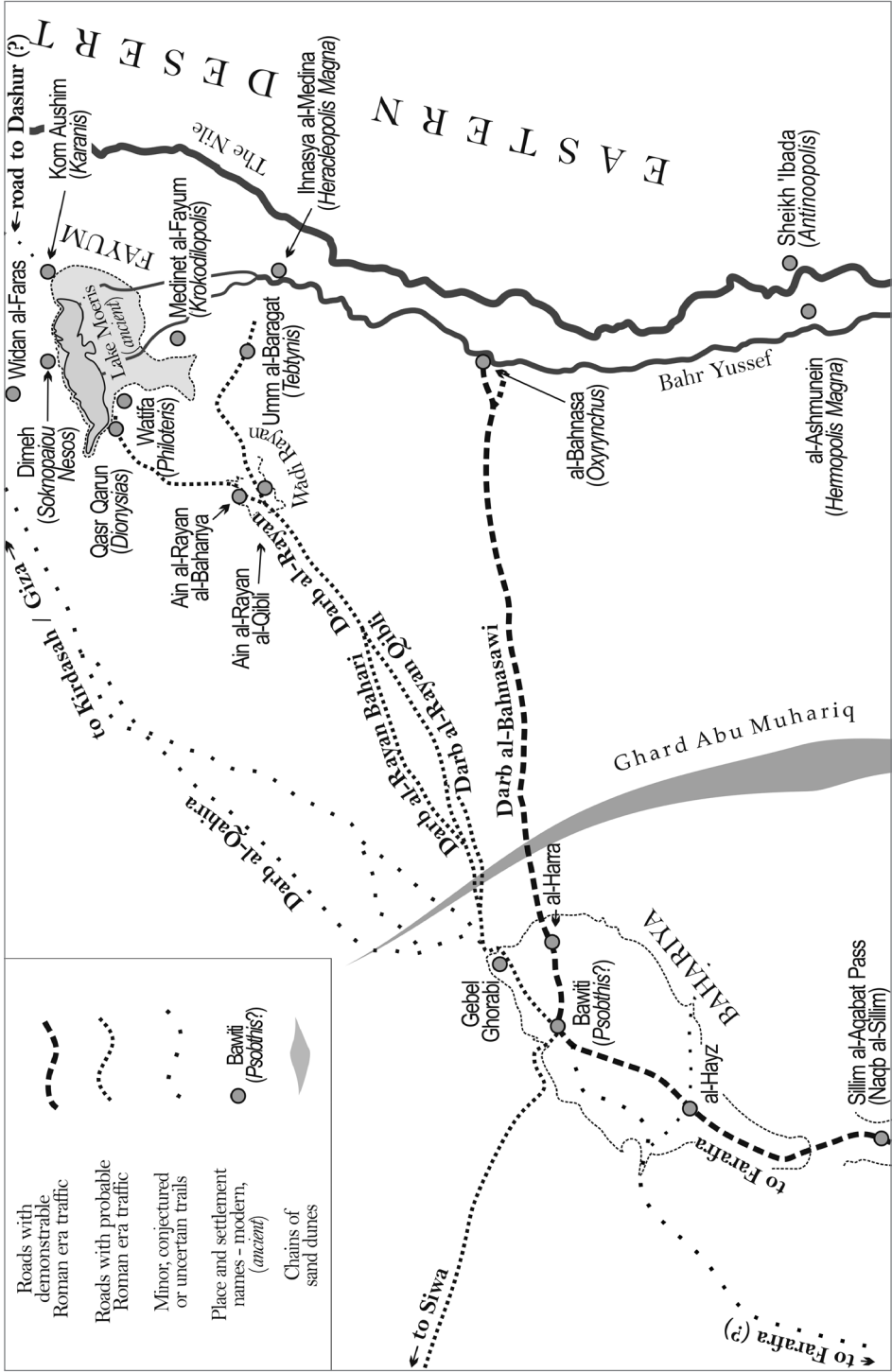


Fig. 6.4 Map 14 - Bahariya-Wadi Rayan-Fayum

Map 14 – Bahariya, Wadi Rayan, and Fayum

Bahariya, known in the Graeco-Roman period as the Small Oasis (*Oasis Parva* [Lat.]/*Mikra* [Gr.]), lies at the centre of the Western Desert, a convergence of desert trails linking it to Siwa, Farafra, Fayum, and the Nile Valley.

At least two trails connected Bahariya to the Valley. Under the Romans, the oasis had very close economic ties with the city of al-Bahnasa (*Oxyrynchus*), to which it was connected with a well-trodden trail, today known as DARB AL-BAHNASAWI. Another road, DARB AL-RAYAN, linked Bahariya to Wadi Rayan wells/grazing grounds and to the agricultural communities of Fayum: Roman-era material has been reported alongside Darb al-Rayan, yet the trail has not been properly surveyed. Yet another road, modern DARB AL-QAHIRA, links Bahariya to Giza and Kirdasah. Fakhry claimed that Darb al-Qahira sits atop an ancient caravan track, traces of which were obliterated by countless tyre tracks. A waterless and rough track, Darb al-Qahira could be travelled only with the greatest effort; accordingly, it appears extremely unlikely that it was plied by ancient caravans, since another road northeast which was much easier to traverse led through Wadi Rayan (but see Map 12 [section 6.2.2] for a possible link to ‘DASHUR’ ROAD).

Other trails linked Bahariya to oases. A well-documented ancient road led from Bahariya to its sister oasis, Farafra (BAHARIYA–FARAFRA ROAD), passing by minor agricultural communities since swallowed by shifting sands. Between Bahariya and Siwa an ancient route (DARB AL-SIWA) ran via the al-‘Areg oases cluster, where traces of Graeco-Roman settlements have surfaced. Darb al-Siwa was probably used only infrequently, owing to rough terrain, marshes, and salt pans on the road.

Maps and materials consulted: Jennings-Bramly 1897, 601 (map of Siwa); 1902, 73–75, map; Giddy 1987, map I; Barrington Atlas (ed. Talbert 2000), maps 73, 75, 77; Graeff 2000, maps XVI, XVII, XVIII; Jackson 2002, 156, map 4; Eichhorn *et al.* 2005, 215, fig. 1; Thissen 2013, 396.

DARB AL-BAHNASAWI (BAWITI–AL-BAHNASA) (section 6.4.2): Bawiti (*Psobthis*?) → al-Harra → al-Bahnasa (*Oxyrynchus*)

DARB AL-RAYAN (section 6.4.1): Bawiti (*Psobthis*?) → Gebel Ghorabi → [trail splits into northern (al-Bahri) and southern (al-Qibli) branches] → [trail merges] → Wadi Rayan → [trail bifurcates] → [northern branch:] → Ain al-Rayan al-Bahariya → Qasr Qarun (*Dionysias*) → Watifa (*Philoteris*) | [southern branch:] → Ain al-Rayan al-Qibli → Umm al-Baragat (*Tebtynis*) → Ihnasya al-Medina (*Heracleopolis Magna*)

DARB AL-QAHIRA (section 6.4.1): Bawiti (*Psobthis*?) → Gebel Ghorabi → Kirdasah/Giza (?) (not depicted)

BAHARIYA–FARAFRA ROAD (section 6.9.2): Bawiti (*Psobthis*?) → al-Hayz → Sillim al-Aqabat Pass → Wadi Hinnis (not depicted) → Ain al-Wadi (not depicted) → al-Qasr (Farafra) (not depicted)

BAHARIYA–SIWA ROAD (DARB AL-SIWA) (section 6.9.1.1): Bawiti (*Psobthis*?) → Sitra (not depicted) → al-‘Areg (not depicted) → Aghurmi (*Ammonos Hieron*) (not depicted)

Because the trail was so short, it could be conveniently crossed by donkey caravans, forming the best and most travelled connection between Bahariya and the Nile Valley. Indeed, Oxyrynchus and Bahariya had strong administrative and commercial links in the Graeco-Roman period,¹⁷⁶ with the Oasis and the traffic on ancient Darb al-Bahnasawi taxed by Oxyrynchite officials. A special desert road force (ἰχνους ἐρημοφυλακία, *ichnous eremophylakia*) levied a toll (διαπύλιον Ὀάσεως, *diapylon Oaseos*) on travellers entering and leaving the city.¹⁷⁷ Private letters of these road overseers, dated to the reign of Ptolemy VII, suggested to Ursula Kaplony-Heckel that the road supervisors manned an as-yet-unidentified outpost on the road stretch between the Oasis and the Nile Valley.¹⁷⁸ Tentatively dated to 130s BCE, ostraca record desert watchmen asking their colleagues in Oxyrynchus for water and provisions.¹⁷⁹ It is not known whether the desert outpost still functioned in the Roman period. However, it is not impossible. The authorities would definitely want to tax traffic on this road, as they did on one between Coptos and the Red Sea, to bear the cost of watchmen's supplies and road repairs.¹⁸⁰ Darb al-Bahnasawi was probably travelled well into the Late Roman period. In 1993, a German team led by Rudolf Kuper surveyed a site 50 kilometres east of Bahariya Oasis, where they found an upper half of a ribbed Late Roman-Coptic storage jar with a short neck. Several pieces of these distinctive ribbed jars were also found along the roads linking Dakhla Oasis to the Nile Valley, pointing to a possible common point of origin of these vessels.¹⁸¹

6.5. Asyut Oasis Junction (roads from Farafra, Dakhla, and Kharga to Asyut)

Beni Adi village near Asyut is the terminus of three important trails that link major oases to the Nile Valley: Darb Asyut to Farafra, Darb al-Tawil to Dakhla, and the Asyut–Kharga road to Kharga Oasis.

6.5.1. Darb Asyut (Asyut–Farafra) (Maps 15 and 20)

This little-known and rarely used trail runs through 280 kilometres of barren terrain between the Farafran escarpment and the edge of the Nile Valley, connecting the Oasis to sites of Beni Adi, Dashlut, and Mayr; it could be covered in 7 or 8 days by a camel.¹⁸² Modest volume of recorded traffic on this road stems from Farafra's unique location. As the westernmost of all oases, excluding Siwa, Farafra was separated from the Valley by a vast swath of waterless desert; accordingly, caravans preferred to cross over to Bahariya or Dakhla and head for the Valley from these sites, rather than to brave the more direct, but waterless link of Darb Asyut.¹⁸³ On its way, Darb Asyut must have crossed the treacherous Ghard Abu Muhariq dune chain and may have passed a prehistoric site at Djara Cave;¹⁸⁴ regrettably, little else is known about the sites on this road or about whether it was regularly travelled in Antiquity. During his desert travels in 1912, Harding-King camped on Darb Asyut by the roadside spring known as Bir Qarawein and reported seeing heaps of rough burnt brick, which he very tentatively dated to the Roman era: overly reliant on Harding-King's account,

Cassandra Vivian has characterised these remains as Roman watchtowers (*burgi*).¹⁸⁵ Until further research is done on these buildings, Roman-era traffic on Darb Asyut cannot be proven.

6.5.2. *Darb al-Tawil (Asyut–Dakhla Oasis) (Maps 15 and 21)*

Dakhla Oasis lies in a deep depression, rugged cliffs of the Egyptian Limestone Plateau rising up to the north of the oasis. At irregular intervals, the line of cliffs is broken by narrow passes, corridors for trails connecting Dakhla to the sites situated north or northeast. One such trail is the 266-kilometres-long Darb al-Tawil, which originates northeast of Balat, ascends the Plateau through a local pass (Naqb Balat, ‘Balat Pass’), and continues northeast for 250 kilometres to arrive in Beni Adi, 27 kilometres north-west-north from Asyut. Still travelled in the 19th century CE, the trail can be crossed in 6.5 days at a usual pace and with a customary load – or in 4 days with lightly loaded, well-rested camels.¹⁸⁶ The road traverses areas covered with rocks, gravel, and sand sheet; chief obstacles to be overcome are dunes of Ghard Abu Muhariq and smaller drifts accumulating along the escarpment edge.¹⁸⁷ Importantly, the crossing today is nearly waterless, and caravans need to secure their own water supply.¹⁸⁸ Darb al-Tawil stands for an important case study in the desert road archaeology, being one of the first Egyptian desert roads to be investigated with satellite imaging. As it happens in other arid areas, feet of donkeys and camels walking along Darb al-Tawil wore grooves in the greyish desert surface; these indentations, subsequently filled by yellow drifting sand, stand out clearly in high resolution satellite images. Unfortunately, such ancient tracks have since been partially obliterated by tyres of modern motorcar expeditions, as tourists and adventurers often drive through and disturb these sand-filled tracks. Nonetheless, a trained eye still can distinguish trail lines in the disturbed context and ascertain whether they are ancient or modern in origin. Ancient trails split into multiple parallel tracks in places where animals could spread out and contract again into narrow pathways when animals entered more demanding terrain, a feature not shared by uniformly narrow tyre tracks.¹⁸⁹

As for the run of Darb al-Tawil, the trail first leaves Balat then leads east-north-east towards the Limestone Plateau escarpment and finally climbs onto it through a gently ascending shelf of Balat pass. Remains of Roman and Arabic pottery strew the slope between the village and the pass, pointing to the continuous use of this trail in the Graeco-Roman Antiquity.¹⁹⁰ Dynastic and Graeco-Roman travellers in the area left not only pottery shards, but also graffiti. For instance, the Halfet al Bir site in the vicinity of the pass has Late Roman and Coptic carvings.¹⁹¹ Having climbed the escarpment, Darb al-Tawil cuts northeast through the Plateau and arrives at the only discovered road station along its run. At Abu Gerara, 25 kilometres northeast from Balat Pass, many desert trails converge before ascending the Abu Gerara escarpment via the Naqb Shusina bottleneck pass.¹⁹² Remains at Abu Gerara junction comprise a wood-lined well where Harding-King and his men found Ptolemaic coins, purple glass, pottery shards, metal objects, and traces of other structures. According to Harding-King, the site probably used to be a military fort guarding the local wells. Desiccated

Map 15 – Trails from Farafra, Dakhla, and Kharga Oases to the Nile Valley

The towering Egyptian Limestone Plateau forms the chief part of the southern Western Desert, tumbling down to the oases' depressions along precipitous, rugged cliffs: the difference in height between the Plateau and oases brings oases much closer to the water table and hence led to the development of agriculture in this otherwise barren region. Here, three major oases (Farafra, Dakhla, and Kharga) arc across the desert and flank the Plateau from the west, southwest, and south; numerous desert trails transverse the Plateau, connecting them to the Nile Valley in the east. The tableland surface they cross is covered partly by rocky outcrops (*hamada*), partly by narrow bands of gravel (*serir*) and partly by shifting sands (*erg*). The most important (yet narrow) dune chain, Ghard Abu Muhariq, stretches through the Limestone Plateau from an area north of Bahariya to the northern reaches of Kharga, hindering travel between the Nile Valley and the oases. Larger dune chains stretch to the southwest of the oases, seamlessly blending into the Great Sand Sea that flanks Egypt from the west, protecting it from all but the most desperate invaders.

Traffic between the Nile Valley and the oases follows the most expedient and quick routes across the Plateau. From Kharga, the closest oasis to the Valley, several well-trodden, crisscrossing trails led to Asyut (*Lycopolis*), Sohag (*Bompae*), Akhmim (*Panopolis*), Farshut, Girga (*Thinis*), al-Madfouneq (*Abydus*), Esna (*Latopolis*), and Edfu (*Apollonopolis Magna*). Discussed in greater detail on Map 16, all these trails yield evidence confirming or suggesting Roman-era traffic. From Dakhla, a road known as *DARB AL-TAWIL* ran to Beni Adi and Asyut. Along this road, one finds the Ptolemaic military-watering site of Abu Gerara and numerous Late Roman pottery dumps. Farafra's road link to the Valley, *DARB ASYUT*, appears not to have been trodden under the Romans, possibly due to Farafra's relative isolation; nevertheless, the trail still awaits proper surveying.

Inter-oasis Roman-era trails linked Dakhla to Kharga (two trails) and Farafra to Bahariya (one trail), but not necessarily Farafra to Dakhla, for which road evidence remains circumstantial. It has been speculated that remote Farafra possessed a link to Siwa Oasis and Libya, although absolutely no data surfaced to support these claims. *ABU BALLAS TRAIL*, arguably the first long-range desert trail in Ancient Egypt, linked the Dakhla Oasis to Gilf Kebir Plateau and regions further south. Furnished with pottery water caches, this important road was early Egypt's (ca. 2200 BCE) gateway to Central Africa (Förster 2013). Intermittently used up to the Islamic period, watering sites of *ABU BALLAS TRAIL* occasionally yield small amounts of Roman pottery, the furthest assemblage found at site Jaqub 00/23, 173 kilometres from Dakhla (cf. Hendrickx, Förster and Eyckerman 2013, 360–362, 362, fig. 28).

Maps and materials consulted: Giddy 1987, map I; Morkot 1996, 91, fig. 4; Barrington Atlas (ed. Talbert 2000), maps 73, 75, 77, 79, 80; Graeff 2000, maps X, Xb, XII, XVIII, XIX, XX, XXI; Darnell 2002, 134, fig. 2; 2013, 222, fig. 1; Darnell and Darnell 2002, 4, fig. 1ab; 2006, fig. 2; Eichhorn *et al.* 2005, 215, fig. 1; Bubenzer and Bolten 2013, 63, fig. 1, 73, fig. 10; Förster 2013, 300, fig. 5, 313, fig. 37; Hendrickx, Förster and Eyckerman 2013, 343, tab. 1, 340, fig. 1.

Kharga–Nile connections (see Map 16 for details): Kharga–Asyut road (section 6.5.3); Sohag road (section 6.6.1); Kharga–Farshut (*Darb al-Refuf*) (section 6.6.1); Kharga–Girga/Abydus (*Darb al-Deir*) (section 6.6.1); Kharga–Esna/Edfu road (section 6.6.3)

DARB BITAN (FARSHUT–KURKUR) (section 6.8.2): Farshut (approximately) → Nuq Maneih → Kurkur Oasis (not depicted)

DARB AL-TAWIL (DAKHLA–NILE VALLEY) (section 6.5.2) → Balat → Abu Gerara → Beni Adi

DARB ASYUT (FARAFRA–NILE VALLEY) (section 6.5.1): al-Qasr (Farafra) → Bir Murr → [across the Plateau] → Beni Adi

Dakhla–Kharga connections (see Map 21 for details): DARB AL-GHUBBARI and DARB AIN AMUR (section 6.9.4)

DARB AL-FARAFRA (DAKHLA–FARAFRA) (section 6.9.3): al-Qasr (Dakhla) → Bir Dikkar → al-Qasr (Farafra)

DAKHLA–FARAFRA ROAD (section 6.9.3): al-Qasr (Dakhla) → Bir Abu Minqar → al-Qasr (Farafra)

FARAFRA–BAHARIYA ROAD (section 6.9.2): al-Qasr (Farafra) → Ain al-Wadi → al-Hayz → Bawiti (*Psobthis?*) (not depicted)

FARAFRA–SIWA (?) (section 6.9.1.2): al-Qasr (Farafra) → Ain al-Dalla → Siwa Oasis (not depicted)

FARAFRA–LIBYA (?) (section 6.10.2): al-Qasr (Farafra) → Ain al-Dalla → Libya?

ABU BALLAS TRAIL (section 6.10.4): Balat → Meri 99/55 site → Jaqub 00/23 site → Abu Ballas (not depicted) → Gilf Kebir (not depicted) → Gebel Uweinat (not depicted) → Libya? | Chad?

remains of palm trees found in the vicinity indicate the spot once had plentiful water supply and could have provided for caravans headed for the Nile Valley.¹⁹³ The area between Abu Gerara, Djara, and Balat has been intermittently studied by teams of German archaeologists based at the University of Cologne;¹⁹⁴ these surveys focused on prehistoric sites and uncovered a great amount of material left by early herders and pastoralists, but historic ruins at Abu Gerara and other Graeco-Roman sites have been surveyed only in passing. The German finds in the area most relevant to this study were fragments of several ribbed, short-necked Late Roman-Coptic storage jars, secured from roadside pottery assemblages.¹⁹⁵ Strewn along minor trails paralleling Darb al-Tawil proper, shards came from vessels made for storing liquids; one of secured fragments still contained a reddish residue subsequently identified as polymerised animal fat or plant oil, proving liquid oils or solidified fats were traded along these routes in the Late Roman period.¹⁹⁶ After leaving Abu Gerara, Darb al-Tawil continues northeast and passes conspicuous rock sites of al-Qantara, Mugali Qibliya, and Qaret al-Saba to reach the Beni Adi junction near Asyut.

Ongoing surveys in the region identified many minor trails that link the main run of Darb al-Tawil to other sites in Dakhla Oasis; this study will briefly discuss two of them that yielded variable amounts of pre-Islamic material. A side track joins Darb al-Tawil to the al-Qasr site (the western part of Dakhla); leaving al-Qasr, it continues east for 15 kilometres, ascends the plateau through a local pass, and continues east-north-east until it converges with Darb al-Tawil.¹⁹⁷ Recent studies indicate this shortcut

was travelled in the pre-Islamic period, with Darb al-Tawil and adjacent trails marked by conspicuous roadside markers, such as cairns and stone slabs.¹⁹⁸

Having pored over satellite images of the Dakhla escarpment, Bubenzer and Bolten identified and subsequently ground-checked another trail, Harding King's Darb al-Khasabi, that could have linked Dakhla to the Nile Valley.¹⁹⁹ This poorly-surveyed pathway diverged from Darb al-Tawil branch just as it ascended the plateau and then struck north in an elongated arc, eventually turning east-north-east and finally converging with Darb al-Tawil, northwest to the conspicuous stone landmark of Qaret al-Saba.²⁰⁰ Ground checks along the trail's run identified numerous sites with pre-Islamic pottery remains, although the authors curiously did not specify the percentage of Roman shards.²⁰¹ Probably, Darb al-Khasabi was a local linking road, passing desert sites in the area between Dakhla, Farafra, Abu Gerara, and Asyut.

6.5.3. *Asyut–Kharga (Oasis Road) (Maps 15, 16, 21)*

Similarly to Dakhla, Kharga Oasis lies in an elongated hollow surrounded by steep, 400-metre high cliffs that encircle the deep from northwest, north and east; in contrast, the southwestern portion of the oasis floor gradually ascends to meet the chain of dunes that marks its western boundary.²⁰² At irregular intervals, the line of cliffs around Kharga is broken by seven or eight narrow passes that constitute bottlenecks for interweaving trails that link the oasis to the Nile Valley.²⁰³ One such trail links Kharga to Asyut (ancient Lycopolis), running 210 kilometres north-east-north towards the Nile. The Kharga–Asyut link constitutes the northernmost stretch of Darb Arbain, the famed Road of Forty, which continued south of Kharga through a series of minor oases (al Shabb, Selima, and Laqiya Arba'in) to Sudanese lands of Darfur and Kordofan, from where slaves and goods were imported into Egypt from the Middle Ages to the 19th century.²⁰⁴ The volume of putative Roman traffic on Darb Arbain on its southern stretch – if any – is discussed in section 6.10.3 of this study.²⁰⁵

At northern Kharga, two important long-distance desert trails crossed. One, an ancient equivalent of Darb Arbain, went from Asyut to Kharga and continued southwards along the villages of Kharga to parts unknown; the other one originated in Upper Egypt and struck westwards, bisecting Kharga and following to Dakhla and beyond.²⁰⁶ Its origin marked by a conspicuous, isolated cairn, the Kharga–Asyut trail leaves the aforementioned crossroads and strikes northwards through a terrain dotted with tufts of wild vegetation and remains of former settlements.²⁰⁷ As for the road, land surveys done by the North Kharga Oasis Survey (NKOS) team in 2001–2002 seasons found traces of an elongated surface anomaly that could be interpreted as trail remains.²⁰⁸ A long swath of packed sand, standing out in colour and texture, fills the bed of a wide gully abutting the northwestern Khargan escarpment. NKOS principal surveyors, Salima Ikram and Corinna Rossi, juxtaposed the North Khargan ground anomaly with similar sand strips appearing along old caravan routes south of Kharga, where the soil had been made compact by feet of countless camels treading these trails; however, only future surveys can prove or disprove whether the gully bed was travelled in the Antiquity.²⁰⁹

Having followed the surface anomaly on feet, NKOS surveyors noted numerous archaeological sites situated east of its run that may or may not have been waystations for Roman-age travellers moving northwards. One such site was situated at an isolated rocky outcrop south of Qasr al-Someira, nicknamed the *Pot Rock* for the sheer quantity of pottery shards strewn around its base, left by generations of travellers resting in its shade.²¹⁰ Further north lies a sizeable swath of formerly cultivated land known as Ain Gib/Qasr al-Someira complex; this elongated archaeological site (8.5 kilometres on N-S axis and 3 kilometres on W-E axis) was named after two diminutive Roman fortlets (spaced ca. 2 kilometres apart) that tower over the complex.²¹¹ Dated to the 3rd–5th century CE, the site abounds in ancient remains. Ruined hamlets adjoin formerly cultivated fields, irrigated with elaborate subterranean water harvesting systems. The northern, larger fortlet at Qasr al-Gib drew its water from an adjacent underground aqueduct, the shaft of which (*qanat*) had been widened to serve as a well for the fortlet personnel and passing travellers.²¹² NKOS surveyors believe these twinned fortlets at the cultivation edge guarded the Kharga–Asyut passageway and the ascent to the oasis escarpment.²¹³ It appears that the road had at least two branches that lined the Ain Gib/Qasr al-Someira complex from the west and east. Three road-marking cairns and a line of feet-compressed sand abut the western limit of the site, whereas southeast of Qasr al-Gib one finds a resting place with a stone engraved with Arabic and pre-Arabic markings, badly eroded by wind.²¹⁴ Which of these trails was preferred by ancient travellers remains to be established.

North of Ain Gib lies a site dubbed the Northern Outpost, a sandstone outcrop covered by numerous scribbles and petroglyphs.²¹⁵ A rest station, the outcrop adjoins a single dying palm, but vestiges of vegetation in the vicinity indicate the place used to have access to an abundant water source and could have supplied caravans resting in its shade. Among Arabic engravings and undated petroglyphs at the Outpost, one finds a badly damaged Greek inscription, surrounded by images of feet and sandals (*plantae pedis*).²¹⁶ To date depictions of feet in an Egyptian context remains a difficult endeavour. Foot/sandal carvings, commonly found in the Mediterranean lands, are primarily thought to be Graeco-Roman identity markers or signatures; conversely, they are rare – although not unheard of – in Egyptian Old Kingdom contexts and thus perfunctorily ascribed to Graeco-Roman travellers in Egypt.²¹⁷ More recent research challenges these simplistic datings. *Plantae pedis* signed with early Egyptian scribbles were found in undisturbed Old Kingdom contexts at desert hilltop sites and waystations adjoining Dakhla and Kharga. Today, they are thought to be identity markings left by Old Kingdom soldiers manning these desolate outposts; only later was this custom adopted by Graeco-Roman travellers in the area.²¹⁸ In light of these findings, unsigned *plantae pedis* at the Northern Outpost could either be roughly contemporary with the aforementioned Greek inscription, or they could have been carved by local travellers in the Old Kingdom period; hopefully, the publication of the Greek engraving will shed some light on this issue.

Beyond the Northern Outpost, the trail turns northeast and strikes for the escarpment to the north.²¹⁹ At this point, a traveller headed for Asyut could either

turn north to climb the Ramia Pass or veer northeast to ascend the Yabsa Pass. A trail branch towards Ramia soon bottlenecks into the so-called 'Corridor', an ascending ribbon of hardened sand marked by grooves worn by feet of countless camels climbing the pass.²²⁰ The pass, Aqabat al-Ramia ('the sandy obstruction'), pierces the escarpment at the very northeastern tip of the Kharga trough. A traveller approaching this pass steps on a thick layer of shifting sand that has accumulated in this passageway;²²¹ sand deposits did even out the slope for human travellers, but they hinder the progress of loaded camels, which sink to their knees into the loose surface cover.²²² Indeed, NKOS surveys around the Corridor area found seven donkey skeletons and three camel carcasses; interestingly, the passage appears to have been more of a hurdle for Kharga-directed traffic, with exhausted animals losing their lives in the treacherous quicksand. On its way upwards, the trail passes three Late Roman pottery assemblages dated to the late 2nd and 3rd century CE.²²³ Leaving the Ramia Pass, the road strikes north-east-north, intersects a waterless stretch of the desert, and terminates at Beni Adi, with one minor trail branching off mid-way and veering northeast to a Nile Valley village of Zarabi, 25 kilometres south of Asyut.²²⁴ Alternatively, the traveller proceeding northeast from Kharga could have headed for Yabsa Pass, 13 kilometres south of Ramia Pass; a trail branch through Yabsa ascends the Limestone Plateau and immediately turns north to converge with the Kharga-Asyut road. It has been argued that both ancient and modern caravaneers leaving Kharga for the Nile Valley preferred to ascend the Limestone Plateau via Yabsa rather than Ramia, as the Yabsa passageway is not as choked with sand drifts as its northern counterpart; a markedly smaller number of animal carcasses found at Yabsa foothills appears to support this hypothesis.²²⁵

6.6. Other roads from Kharga to the Nile Valley

All direct traffic between Kharga and the Nile Valley goes through seven passes that link the Khargan depression to the raised upland of Limestone Plateau to the east. Going from north to south, one encounters Ramia, Yabsa, Refuf, Abu Sighawal, Bulaq, Jaja, and Dush passes, with every pass connected to one or two roads linking it to the Valley. The ease of crossing the flat Limestone Plateau between Kharga and the Nile resulted in a veritable tangle of trails, many of them still unsurveyed. Roads leaving Kharga through Ramia and Yabsa have been discussed in the preceding section (6.5.3). From Refuf pass, one trail (the Sohag road) heads northwest towards the area of modern Sohag (ancient Bompae), whereas another (Darb al-Refuf) strikes east-north-east, towards Karnak, Farshut, and other sites in the Qena Nile Bend. In turn, Darb al-Deir leaves Kharga via Abu Sighawal pass, crosses Darb al-Refuf, and terminates at Abydos. Both roads run parallel to each other and branch out before reaching the Nile Valley, with uncertain trajectories and many points of arrival. To the south, several little-known trails leave Kharga through Bulaq and Jaja passes, striking for al-Rizerqat, Farshut, and possibly Esna; it has not been convincingly demonstrated whether they were travelled in the Graeco-Roman period. Conversely,

the Darb al-Dush trail (via Dush pass) that links the Khargan town of Baris to Esna and Edfu shows signs of having been well-travelled in the Roman period, with many ancient installations along its run testifying to its former popularity.

As it is, the Limestone Plateau between Khargan escarpment and the Nile Valley is criss-crossed by a dense web of trails with unclear origins and termini. What facilitated crossing the desert strip between the Nile and the oasis was the area's unique topography. A relatively narrow desert band (ca. 200 kilometres), the Limestone Plateau stood for an interconnected zone between two fertile swaths of land and, as such, it is a primary research area for road density studies. Unlike Marmarica Plateau, surveyed by Eastern Marmarica teams, the area has not been recently investigated in detail as a whole. Older geographical-geological surveys of Beadnell (1909) and Caton-Thompson and Gardner (1932/1952) primarily investigated the region between northern Kharga and the Qena bend, with surveyors recording remains of what they interpreted to be Ptolemaic/Roman watering stations; these structures have not yet been thoroughly investigated. The next round of area studies, conducted by the Theban Desert Road Survey (TDRS) teams (University of Yale), was more focused on pre-Ptolemaic sites and on lands adjacent to or only bordering the Plateau. Consequently, Roman remains and roads traversing the central part of the Plateau were somewhat neglected. Formerly exploring roads in the Qena Nile Bend, the TDRS researchers have recently begun to investigate roads that leave the Qena Bend and enter the Plateau (for instance, Darb al-Refuf); even so, they tend to devote more attention to pre-Dynastic and Dynastic material at the road sites (2013). In turn, North Kharga Oasis Survey project (the American University of Cairo) examines northern Kharga sites, such as Ain Gib and Qasr al-Someira, which yielded valuable Late Roman material (2013, 2007, 2004); unfortunately, the scope of this survey remains limited to the Khargan depression, with little attention devoted to the Plateau to the east. In sum, a comprehensive study of trails from Kharga to the Nile Valley encounters problems arising from the lack of focused, up-to-date evidence. Nonetheless, combining data from NKOS and TDRS surveys sheds some light on these desert routes and the volume of traffic on them.

6.6.1. *The Oasis Roads (Sohag road/Darb al-Refuf/Darb al-Deir)* **(Maps 15, 16, 21)**

Several of the roads linking Kharga to the Nile Valley originate at the imposing Diocletianic fort at al-Deir, next to an ancient watering station at the foothills of Gebel Ghennima.²²⁶ Moving eastward from al-Deir, a Roman-era traveller heading for the Nile would first have to climb the Khargan escarpment, either through the Refuf pass (to the northeast of the fort) or through the Abu Sighawal pass (directly east of the fort). The former pass (Naqb al-Refuf), 45 kilometres northeast of Kharga town, ascends in a gentle slope to the Limestone Plateau; traces of prehistoric chert quarries in the area indicate this passageway has been traversed from times immemorial by desert travellers leaving and entering the Khargan depression.²²⁷ After climbing the

plateau, the trail winding its way through Naqb al-Refuf bifurcates near a prominent limestone outcrop called al Shugera; one branch (the Sohag road) heads northwest, towards the area of modern Sohag, whereas another (Darb al-Refuf) strikes east-north-east, towards Farshut and Gebel Qarn al-Gir road junction.²²⁸

The road branch leading from the Refuf pass towards Sohag (the Sohag road) appears – on the basis of epigraphical evidence – to have been well-travelled in the Graeco-Roman period, with contemporary settlements in the area (Tahta [ancient Toeto] and Akhmim [ancient Panopolis]) having strong economic and administrative ties with Kharga Oasis. At a local Nile Valley quarry at Gebel es-Sheikh al-Haridi, *strategos* Psais celebrated the site's opening in the 11th regnal year of Ptolemy XII (70/71 BCE) with an inscription dedicated to the gods of Panopolis; the inscription mentioned a road that linked the quarry to the village of Hibis in Kharga – probably, the modern Sohag road.²²⁹ In the same vein, a 3rd century CE papyrus found at a neighbouring site of Panopolis refers to *oreophylakes hodou Oaseos* [ὄρεοφύλακες ὁδοῦ Ὁάσεως], overseers of the Oasis Road, who guarded the trail linking Panopolis to Kharga.²³⁰ Sources testify that, in the 4th century CE, *oreophylakes* at this road were replaced by deployments of camel riders from *Ala dromedariorum II*, who stationed in camps at Toeto and Psinabla.²³¹ Generally speaking, papyri and inscriptions suggest the Sohag road was travelled in the Graeco-Roman period; regrettably, the run of the trail has not been surveyed for Roman-era pottery assemblages and road stations.²³² Since all the evidence we possess is epigraphical and thus circumstantial, the Roman-era traffic on the Sohag road, although likely, cannot be officially confirmed.

Another road branch radiating from the Refuf pass, Darb al-Refuf diverges from the Sohag road and strikes east-north-east for 180 kilometres, heading towards the Nile; the winding trail enters the Valley at Wadi Samhud, a broad gully situated several kilometres south of Abydos, where it branches out with links to Farshut, Hu and Gebel Qarn al-Gir, a major desert road junction in the Qena Nile Bend.²³³ Darb al-Refuf is most widely recognised today as the road travelled by Harkhuf, a Sixth dynasty government official serving under Merenre I. As an overseer of traffic on the desert roads of Upper Egypt, Harkhuf repeatedly crossed the Western Desert to visit many exotic locales – among them the fabled land of Yam, the location of which still has not been unanimously agreed upon by researchers of the topic – and had his exploits commemorated in his funerary inscription.²³⁴ Of chief interest to this study is Harkhuf's third journey, during which he followed the 'Oasis Road' from Thinis to Kharga, which probably equals modern Darb al-Refuf.²³⁵ Problematically, the 'Oasis Road' toponym has since been used to refer to a number of different roads linking Kharga to the Nile; for instance, the previously discussed 3rd century CE papyrus from Panopolis equated the Oasis road with the Sohag road.²³⁶ Furthermore, the Sohag road, Darb al-Refuf and Darb al-Deir run in close vicinity to one another and are often misidentified, adding to the confusion. In light of these discrepancies and ambiguities, it is better not to attempt to affix the 'Oasis road' toponym to any specific road in the area.

In the Middle Kingdom and Second Intermediate Period, Darb al-Refuf became the favoured connection between the northern part of the Kharga Oasis and the Nile Valley.²³⁷ Travellers of the Dynastic period proceeding along the trail from Kharga stopped at two major sites along the trail (Tundaba and Abu Ziyar), where Theban Desert Road Survey (TDRS) teams led by John and Deborah Darnell uncovered archaeological traces of Pharaonic occupation. A traveller moving from Kharga to the Valley would first arrive at the Second Intermediate Period/New Kingdom road station complex at Tundaba, comprising a deep-shafted well, a cistern, and remains of three stone buildings.²³⁸ Pottery assemblages around the well-produced shards that predominantly date to the Seventeenth/Eighteenth dynasties;²³⁹ other material from the site includes prehistoric flint implements and limited amounts of Middle Kingdom and Roman era pottery fragments.²⁴⁰ Roman shard finds at Tundaba imply the well did not run dry under the Romans, with this former Pharaonic watering station continuing to attract travellers between Kharga and the Valley.²⁴¹ Further east, Darb al-Refuf crosses the road known as Darb al-Deir and subsequently continues east-north-east to Abu Ziyar, an Early Middle Kingdom Pharaonic outpost marked by numerous pottery assemblages;²⁴² similarly to Tundaba, excavations at the site unearthed small quantities of Roman era shards, demonstrating the site saw traffic in that period.²⁴³

Further traces of Roman-era travellers have been found at roadside sites overlying the trail.²⁴⁴ In his 1909 study on Kharga, Beadnell described Darb al-Refuf and reported 'numerous Roman waystations' along the road, their sites marked by heaps of broken water transport amphorae;²⁴⁵ unfortunately, he did not date these shards or plot the heaps. In the 1930s, Getrude Caton-Thompson and her team re-surveyed Darb al-Deir and plotted the elusive watering depots on her maps; the surveyor enumerated no less than five major and several minor pottery sites adjoining the road between Refuf pass and Wadi Samhud.²⁴⁶ Unfortunately, Caton-Thompson's focus was on prehistoric, not Roman, remains and – apart from roughly dating them to the Roman period – she did not research these assemblages in detail. Similarly, Darnell's 2013 study on the road (which he erroneously calls Girga Road)²⁴⁷ concentrated more on the Dynastic remains at Tundaba and Abu Ziyar, rather than on the Roman material, with post-Dynastic remains mentioned only in passing;²⁴⁸ accordingly, Roman pottery heaps along Darb al-Refuf still await proper surveys, if left undisturbed.

Abu Sighawal pass, situated 7 kilometres to the south of Refuf pass, formed yet another point of entry for travellers ascending the Khargan escarpment.²⁴⁹ The trail leading via Abu Sighawal bifurcates as soon as it ascends the Limestone Plateau. One arm turns north and links Abu Sighawal to the Refuf pass and Darb al-Refuf, its run marked by prehistoric chert quarries and scatters of heavily abraded (and as yet undated) pottery shards. Another road arm, Giddy's Girga road and Graeff's Darb al-Deir (I adopt Graeff's nomenclature), initially strikes east-north-east (paralleling Darb al-Refuf) and crosses the Limestone Plateau in its narrowest point (120 kilometres); it soon turns north-east-north and crosses Darb al-Refuf mid-way

between the Oasis and the Nile to end its run near Abydus.²⁵⁰ Taken together, Darb al-Refuf and Darb al-Deir form an X-shaped road system, with the former trail linking Refuf pass to Wadi Samhud and the latter one connecting Abu Sighawal pass to Abydus.²⁵¹

An alternative to its northern sister trail of Darb al-Refuf, Darb al-Deir is the second shortest (193 kilometres) crossing between Kharga and the Valley.²⁵² Papyrological evidence implies the trail was probably travelled in the Ptolemaic period. A list of towns in Thebaid compiled in 239 BCE mentions Abydus next to Hibis in Kharga, the pairing of these sites cited by Wagner as evidence for a direct road connection.²⁵³ In the early 1st century CE, the Abydus–Kharga trail saw much traffic, with Strabo claiming it was customarily crossed in seven days.²⁵⁴ Interestingly, data from the papyrus and Strabo on the Graeco-Roman use of this trail appear to be corroborated by Beadnell's discovery of a Roman roadside pottery site (watering station?) at al Buraig;²⁵⁵ unfortunately, this promising site has not been properly surveyed since his visit and cannot be properly plotted due to confusing descriptions. Up to this point, Darb al-Deir yielded markedly less Roman material than Darb al-Refuf, but future surveys in the area will undoubtedly plot and investigate new Roman sites along its run.

6.6.2. Roads from Bulaq and Jaja Passes to the Nile Valley (Maps 15, 16, 21)

In the central section of the Khargan escarpment, two passes breach the cliffs and provide entrance points for travellers ascending the Limestone Plateau. The more northerly pass, Bulaq, lies 25 kilometres south-west-south from its eponymous village. This is the place where two roads, leading from Kharga town and Bulaq, converge into a single trail and strike eastwards to reach the modern village of al-Rizerqat (ancient Krokodilopolis). The trail's run between Kharga and the Nile Valley is 198 kilometres in length.²⁵⁶ Caton-Thompson claimed yet another trail passes through Bulaq pass and strikes to Esna, being the shortest (176 kilometres) direct crossing between these two sites; however, no extant textual or archaeological sources demonstrate the Bulaq–Esna trail was travelled in Antiquity.²⁵⁷

The more southerly Jaja pass also gets its name from the neighbouring village; a 224-kilometre road through the passageway links ancient Baris to Farshut/Karnak in the Qena Nile bend.²⁵⁸ Roads from Bulaq to al Rizerqat and from Jaja to Farshut meet and cross in the middle of the Limestone Plateau, in a place known as al-Mafariq.²⁵⁹ Neither road has been surveyed for traces of ancient traffic, but, given the fact that breaches in the Khargan escarpment are few and far between, these minor trails may have been occasionally used as direct connections between the central Kharga and the Valley.

6.6.3. Darb al-Dush (Dush/Kharga Oasis–Edfu/Esna branches) (Maps 15, 16, 18)

The southernmost breach in the Khargan escarpment, Naqb al-Dush pass links the ancient village of Baris to the Nile Valley cities of Esna (ancient Latopolis) and Edfu (ancient Apollonopolis Magna); the road branch to Edfu possibly connected to

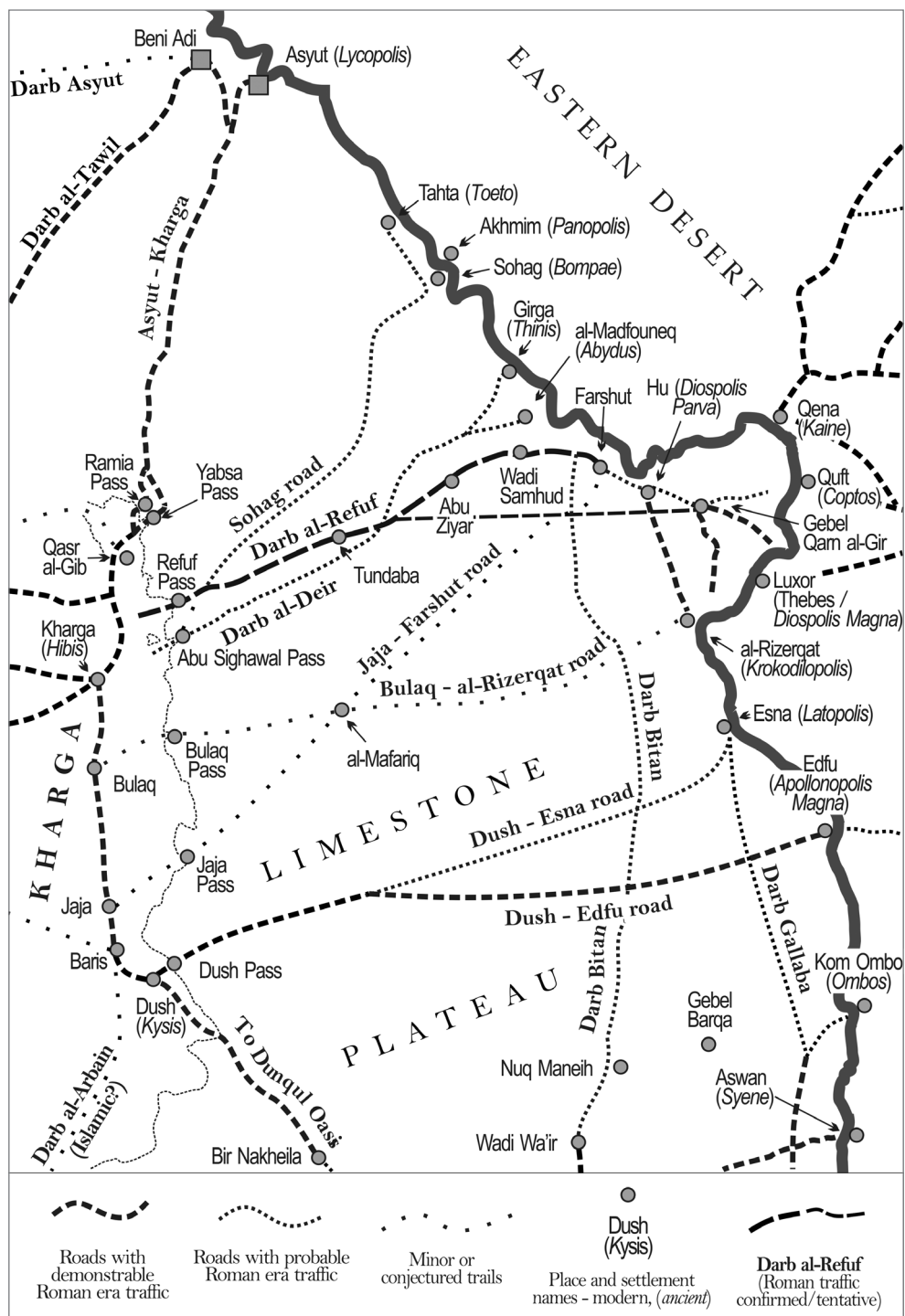


Fig. 6.6 Map 16 - Trails from Kharga Oasis to the Nile Valley

Map 16 – Trails from Kharga Oasis to the Nile Valley

Between the Nile Valley and the Kharga Oasis lies a narrow band of the desert known as the Limestone Plateau. All direct traffic between Kharga and the Nile Valley goes through seven passes that link the Khargan depression to the raised upland of Limestone Plateau to the east. Going from north to south, one encounters Ramia, Yabsa, Refuf, Abu Sighawal, Bulaq, Jaja, and Dush passes, with every pass connected to one or two roads linking it to the Valley. The ease of crossing the flat Limestone Plateau between Kharga and the Nile resulted in a superficially chaotic web of trails, many of them still unsurveyed.

In the Roman period, certain traffic patterns emerged. Roman settlements of Kharga clustered around the two urban centres, Kharga (*Hibis*) in the north and Baris/Dush (*Kysis*) in the south. Both Hibis and Kysis had several connections to the Valley. From Hibis, roads led to Asyut (*Lycopolis*) (→ KHARGA – ASYUT ROAD), Sohag (*Bompae*) and Akhmim (*Panopolis*) (→ SOHAG ROAD), Farshut and, possibly, Gebel Qarn al-Gir (→ DARB AL-REFUF), and to Girga (*Thinis*) and al-Madfouneq (*Abydus*) (→ DARB AL-DEIR). From Dush, roads ran to Esna (*Latopolis*) (→ DUSH – ESNA ROAD) and Edfu (*Apollonopolis Magna*) (→ DUSH – EDFU ROAD). Extant sources confirm or strongly corroborate Roman-era traffic on all abovementioned roads. Two further trails link Khargan villages to the Valley, one leading from Bulaq to al-Rizerqat (*Krokodilopolis*), and another from Jaja to Farshut. No evidence subsequently came to light for Roman (or ancient) traffic on these trails.

Due to the sheer number and intricacy of trails on the Limestone Plateau (and the lack of comprehensive surveys), mapping the area presents inherent difficulties. On my map, the Sohag road is drawn after Giddy (1987, map I). The run of Darb-al Refuf and Darb al-Deir is excerpted from Graeff (2000, map X). These two trails run so close to each other that they have often been conflated, for example by John and Deborah Darnell (Darnell 2013, 222, fig. 1; Darnell and Darnell 2002, 4, fig. 1ab) who erroneously call Darb al-Refuf ‘Girga Road’. Roman-era Darb al-Refuf could have had a side branch leading to Gebel Qarn al-Gir: the Yale Desert Road Survey team led by the Darnells found a track that struck eastwards from Gebel Qarn al-Gir (bypassing Hu) and tentatively identified it as a trail to Kharga (Darnell 2002, 134, fig. 2). Judging by the terrain layout, I believe that the Darnells’ track could be an as-yet-unknown extension of Darb al-Refuf. The northern terminus and initial section of Darb Bitan are only rough estimates (based on Darnell and Darnell 2006, fig. 2), as the track has not, to the best of my knowledge, been properly plotted.

Maps and materials consulted: Caton-Thompson and Gardner 1932, map 1; Giddy 1987, XXX; Morkot 1996, 91, fig. 4; Barrington Atlas (ed. Talbert 2000), map 77; Graeff 2000, map X, Xb, XII, XVIII, XXI; Darnell 2002, 134, fig. 2; 2013, 222, fig. 1; Darnell and Darnell 2002, 4, fig. 1ab; 2006, fig. 2; Eichhorn *et al.* 2005, 215, fig. 1.

KHARGA-ASYUT ROAD (section 6.5.3): Kharga (*Hibis*) → Qasr al-Gib → [road bifurcates] → Ramia Pass | Yabsa pass → [road converges] → [side track to Beni Adi] → Asyut (*Lycopolis*)

SOHAG ROAD (section 6.6.1): Kharga (*Hibis*) → Refuf Pass → [Darb al-Refuf veers off to the east] → Sohag (*Bompae*)/Akhmim (*Panopolis*) → Tahta (*Toeto*)

DARB AL-REFUF (KHARGA–FARSHUT) (section 6.6.1): Kharga (*Hibis*) → Refuf Pass → [Sohag road veers off to the north] → Tundaba → [crossroad with Darb al-Deir] → [possible side branch to Gebel Qarn al-Gir?] → Abu Ziyar → Wadi Samhud → Farshut

DARB AL-DEIR (KHARGA–GIRGA/ABYDUS) (section 6.6.1): Kharga (*Hibis*) → Abu Sighawal Pass → [crossroad with Darb al-Refuf] → [road bifurcates] → Girga (*Thinis*) | al-Madfouneq (*Abydus*)

DUSH–ESNA/EDFU ROAD (section 6.6.3): Baris → Dush (*Kysis*) → Dush Pass → [road bifurcates] → Esna (*Latopolis*) | Edfu (*Apollonopolis Magna*)

DARB BITAN (FARSHUT–KURKUR) (section 6.8.2): Farshut (approximately) → [crosses a putative Kharga – Gebel Qarn al-Gir trail] → [crosses Dush-Esna trail] → [crosses Dush-Edfu trail] → Nuq Maneih → Wadi Wa'ir → Kurkur Oasis (not depicted)

DARB AL-GALLABA (ESNA/KOM OMBO–ANIBA/QASR IBRIM) (section 6.8.2): Esna (*Latopolis*) [western terminus] | Kom Ombo (*Ombos*) [eastern terminus] → [branches converge] → [bypasses Gebel Barqa] → [along the Gallaba Pediplain] → Aniba | Qasr Ibrim (*Primis*) (not depicted)

Darb Asyut → Map 15 | Darb al-Tawil → Map 15 | Darb al-Arbain → Map 18

an Eastern Desert road from Edfu to Berenike (section 5.2.6).²⁶⁰ It is now believed that Darb al-Dush, the road between Baris and Esna/Edfu, was the most important ancient crossing between Kharga and the Nile Valley, with numerous epigraphical and archaeological pieces of evidence pointing to the large volume of Roman-era traffic on that trail.²⁶¹

The initial road section between Baris and Naqb al-Dush was guarded by soldiers stationed in an imposing Roman fort at Dush (ancient *Kysis*).²⁶² Situated 105 kilometres south from *Hibis*, well-watered *Kysis* was the second most important town in the oasis and an administrative seat of a local tax collection area (*toparchy*).²⁶³ Striking east from *Kysis*, Darb al-Dush cuts through a swath of formerly irrigated and cultivated land dotted with shafts of wells and subterranean aqueducts gone dry, the tracks well-marked by side windrows. Significant sites along the road comprise Tell al-Dabba al-Sarqiyya (an unfortified hilltop farming settlement), Ain Ziyada (a hilltop site with a dry-brick temple and a cemetery), and Ain al-Buriq (a farming complex and *hydreuma* at the foothills of the Dush pass); surveys at these sites yielded primarily Late Roman/Byzantine/Arab material, with occasional finds of Ptolemaic and Dynastic artefacts hinting at pre-Roman occupation.²⁶⁴

Further east, Darb al-Dush ascends the Plateau via the Dush pass (Bab al-Dush), the passageway obscured with sand drifts accumulated over the millennia; the narrow trail is marked by a line of large stone cairns, at least one of them tentatively dated to the Roman period.²⁶⁵ On the Limestone Plateau, the road strikes north-east-north through harsh, hummocky terrain; cairns continue beyond the pass to mark the trail's run through rugged gulches and windswept plains. Surveys found no genuine watering station along the central section of Darb al-Dush, although pottery heaps appear along the road at irregular intervals; analysed shards primarily date from

the Late Roman (3rd–5th century CE) period, with no Dynastic, Ptolemaic, or Arab potteries and very few pieces of Early Roman origin. Consequently, it appears that Darb al-Dush was most often travelled in the Late Antiquity, gradually falling out of use in the Islamic period.²⁶⁶

Striking north-east-north for about 100 kilometres, the road bifurcates, with one arm continuing north-east-north to Esna (Latopolis) and another striking east to Edfu (Apollonopolis Magna).²⁶⁷ The Esna branch traverses a flat that gently rises east to meet the edge of the Nile Valley in the vicinity of a Middle Kingdom necropolis at Esna, two prominent hillocks at the edge of cultivation directing the oncoming traffic.²⁶⁸ Little ancient material has been found alongside the Esna branch; in contrast, the Edfu trail adjoins as-yet-unexcavated remains (well shafts, buildings, cairns, stelae) tentatively dated to the Graeco-Roman period. At an unplotted roadside site at the Plateau, Jan-Peter Graeff discovered ruins of a well and a building. Noting their proximity, the surveyor surmised that the well and the building might have been a watering station for travellers following Darb al-Dush, possibly operating in the Roman period;²⁶⁹ unfortunately, no further studies have been done at the site. To the east of the well, Graeff uncovered further traces of ancient activity. Darb al-Dush, at this point about 10 metres wide, is flanked by a series of flat-topped, cube-shaped cairns spaced ca. 50 metres apart, their square bases measuring about 1.5 metres on a side. Similarities between these cairns and Late Roman road markers found along the Qena-Abu Sha'ar route suggested to Graeff that both lines of cairns were erected in the same period.²⁷⁰ Nonetheless, the most convincing piece of evidence pointing to Roman activities along the Edfu branch of Darb al-Dush comes from a line of red porphyry pillars that, spaced at about 50 metre intervals, replaced the humbler cairns as road markers on the road's approach to Edfu.²⁷¹ Although the pillars have all but disappeared, the use of such an expensive material to mark the desert road provides us with incontrovertible proof of the importance Roman administrators of Egypt attached to that desert trail.

As for other connections between Baris/Kysis and the Nile Valley, source material does not reveal any conclusive evidence; nonetheless, some scholars have argued for their existence. Writing from a papyrological perspective, Wagner noted Greek inscriptions at the church at Mounesis and ostraca from Dush were written by inhabitants of Nilotic settlements of Tentyra, Coptos, Thebes, Hermonthis, Asphynis, Latopolis, and Apollonos Ano;²⁷² in his view, a mere mention of a Nile Valley site strongly implies there was a direct connection between the site in question and Mounesis/Dush. Wagner's claims cannot be accepted. Rather than to cross the desert on every passage directly, it would be much more practical to follow two or three well-known and tested linking trails, even if it would entail a slightly longer journey. To brave the desert was and is a daring and risky venture. Inhabitants of Roman Egypt probably would prefer to travel along the well-watered Nile Valley and then enter the desert at specific desert trail junctions, following the shortest and safest routes to their destination.

6.7. Roads crossing the Qena Nile Bend

Several short roads from Hu spread southeastwards like wheel spokes, to cut the Qena Nile Bend and reach the sites on its other side. Darb Rayayna leaves Farshut, passes through Hu, and strikes south-east-south towards al-Rizerqat.²⁷³ The Farshut-Thebes road, also known as the Road of the Horses, strikes southeast from Hu and goes to Gebel Qarn al-Gir, an important caravan road junction. At Gebel Qarn al-Gir, the road from Farshut splits. One branch, known as the Alamat Tal road,²⁷⁴ follows to the area west of Qamula; in turn, the Farshut road proper continues southeast to Western Thebes. Other linking trails connected these roads to the Qena Bend sites. Darb Ba'irat linked the Thebes-Farshut road to Medinet Habu, whereas Darb Arqub al-Baghla connected the Alamat Tal road to the area north of Qamula. Generally, the hilly and rough plateau encircled by the Qena Bend does not suit camels well, as these animals prefer to step on sandier surfaces; accordingly, the main trails traversing the plateau were most travelled by donkey caravans of the Dynastic period, with camel caravans subsequently blazing new, sandier access trails through the Theban escarpment.²⁷⁵

6.7.1. *The road from Farshut/Hu to Thebes (the Road of the Horses) (Map 17)*

The so-called Farshut road connected the Nile Valley towns of Farshut and Hu to Pharaonic necropoleis of Western Thebes; the mass of ceramic/epigraphic evidence points to the road being travelled chiefly in the Dynastic period, with the largest volume of traffic in the Late Middle Kingdom and Ramesside periods. Winding its way along the Valley, the Farshut road leaves Farshut and strikes for Hu (*Diospolis Parva*) subsequently veering southeast to cut across the Qena Bend. Climbing the rugged plateau, the trail first goes past Gebel Qarn al-Gir, a major desert road junction, where it splits into the Theban trail and the so-called Alamat Tal Road; yet another desert trail leaves Gebel Qarn al-Gir and strikes westwards to link this desert crossroads station to Darb al-Refuf and Kharga (section 6.6.1).²⁷⁶ The site, thought to have been a Pharaonic caravanserai, comprises numerous pre-Dynastic/Dynastic inscriptions and enormous stratified debris mounds made of alternating layers of finely crushed pottery, grain hulls, larger ceramic shards, straw, and animal faeces. Each type of material found in the mounds reveals something of past activities at the site. Enormous quantities of water pot fragments demonstrate the site was once frequented by large numbers of animals and humans that slaked their thirst with water stored in these containers. Presence of horse dung and straw suggested to Darnell that the site once must have housed extensive stables for the use of Pharaonic express couriers on the Farshut road; grains found in the mound strata imply the road was once used for shipping wheat and barley, possibly for religious festivals at Thebes and Karnak.²⁷⁷

Leaving Gebel Qarn al-Gir, the Farshut road continues southeast to arrive at Wadi al-Hol/Gebel Roma complex, where surveys found traces of Pharaonic activities similar to those recorded at Gebel Qarn al-Gir. Wadi al-Hol, with the greatest concentration of pre-Islamic material among all Farshut road sites, was probably a mid-way stopping

point on the road; several hundred inscriptions – among them Greek and Coptic scribbles – prove this spot once was a bustling transit site visited by Graeco-Roman travellers.²⁷⁸ On the plateau above Wadi al-Hol, one finds Gebel Roma, a roadside site with enormous pottery/dung/refuse dumps much larger than their equivalents at Qarn al-Gir.²⁷⁹ Pottery shards in the dumps date between pre-Dynastic and Coptic periods, with the largest numbers from Late Middle Kingdom and Seventeenth–Eighteenth Dynasties. Similarly to Gebel Qarn al-Gir, Gebel Roma probably used to be a courier expressway station, with mounds of faeces at the site left by countless horses once kept there; to level the ground and limit the spread of disease, site workers periodically covered layers of excrements with straw, stones, and pottery shards and sealed them off with liquid plaster.²⁸⁰

As the road leaves Wadi al-Hol and approaches the Theban escarpment, it diverges: a linking trail known as Darb Ba'irat turns south, whereas the Road of Horses continues southeast. The next stop on the main road is Gebel Antef, a Middle Kingdom/early New Kingdom site with remains of a roadside temple dedicated to Osiris, erected by an eponymous king Antef V of the Seventeenth Dynasty.²⁸¹ Next to the temple, explorers from the Theban Desert Road Survey team found remains of two badly damaged stela; judging by textual parallels, Darnell deemed them to be twins to a much better-preserved Twenty-first Dynasty stela discovered in the vicinity of Wadi al-Hol.²⁸² If the connection is genuine, then all stelae would commemorate exploits of Panedjem, son of Paiankh and high priest to Amun-Re; the damaged inscription suggests Panedjem supervised the repairs on the so-called High Road of Horses during the reign of Menkheperre.²⁸³ Upon reaching the Theban escarpment, the road turns southwest, away from the Valley of the Kings, and runs parallel to the river, to disappear in the gravel of the desert, its final destination still unknown.²⁸⁴

It is obvious why Farshut Road in the Pharaonic period was known as 'the road of the horses': roadside stelae and graffiti frequently mention and depict these animals, with large quantities of fossilised dung left in place of former roadside stables.²⁸⁵ Nonetheless, did the Farshut road continue to serve as a horse courier expressway in the Roman period, or, more generally, did it see Roman-era traffic? The chief investigator of the Theban Road Desert Survey, John Darnell, certainly believes it was so, arguing the track was a part of a trans-Egypt express road network for horse messengers used well into the Late Roman period.²⁸⁶ Especially important to this study are Darnell's two pieces of evidence (literary passage/papyrus archive) concerning the Roman era horse traffic along the road. The first piece of evidence, a passage from Diodorus Siculus' *Library* (1.45.7), claims 100 horse relay stations were once situated on the road between Memphis and Western Thebes;²⁸⁷ however, the passage also states that, in Diodorus' day, the stations had been abandoned, with only their foundations still in place – a fact Darnell chose to ignore. Admittedly, horse relay lines were not unknown in Roman Egypt, even if supply stations were no longer extant. The second piece of evidence, a roll of the Chester Beatty papyrus from Panopolis, records correspondence between the Panopolite *strategos*, Apolinarius, and the procurator of

Lower Thebaid, Aurelius Isidorus, missives carefully marked with postage and receipt dates. At least three letters travelled from Hermopolis (al Ashmunein) to Panopolis (Akhmim) (192 kilometres) in a single day (15th Feb. 300 CE), a feat that could be accomplished only with the use of extensive and well-organised horse relay lines.²⁸⁸ Darnell cites the Panopolis letters as evidence for such horse relays along Farshut road. Nonetheless, this appears to be a gross overgeneralisation. The Hermopolis–Panopolis run does not equal the Farshut–Thebes run and the use of horse relays along one specific trail does not necessarily mean they were commonplace in Diocletianic Egypt. In sum, Darnell's claim about horse relays being employed along the Farshut–Thebes road cannot be accepted until more pieces of compelling evidence are brought to our attention. Darnell's claims notwithstanding, Greek and Coptic inscriptions found in the vicinity of Wadi al-Hol demonstrate at least the central portion of the trail saw a measure of traffic under the Romans. It appears that the Roman-era traffic preferred Darb Ba'irat to the Gebel Antef branch: discoveries of Roman-era material on Darb Ba'irat (section 6.7.4) suggested to Graeff that camel traffic between Hu and Thebes chiefly plied Darb Ba'irat as a gentler descent into the Nile Valley.

6.7.2. Alamat Tal Road (Map 17)

Discovered by the Theban Desert Road Survey teams in 1993, the Alamat Tal road parallels the Farshut road, descending to the Nile Valley west of Qamula. A fairly typical Egyptian desert trail, the track is made of several parallel grooves worn by animal feet in the soft limestone surface, ruts spreading out on flat terrain for 5–6 metres and converging again into a 2-metre track on rougher surfaces.²⁸⁹ Like its parallel track, the Alamat Tal road adjoins many Pharaonic road installations and inscriptions; on its way, it runs past watchtowers, stone huts, and resting spots, once manned by desert patrols overseeing the traffic on the trail.²⁹⁰

First diverging from the Farshut road at Gebel Qarn al-Gir, the Alamat Tal road initially strikes east-south-east and briefly enters the high desert, its run marked there by several small cairns.²⁹¹ Next, the road approaches Gebel Tjauti, an area well-known for its pre-Dynastic and Dynastic scribbles; the Gebel has been named after an Eleventh Dynasty Coptite nomarch from Qamula, who had a stela erected at the site to commemorate his re-opening and refurbishment of the road, previously blocked by his enemies from Thebes.²⁹² Few post-Ramesside remains have been found at Gebel Tjauti, with a small increase in number in the Coptic period. Importantly, the site yielded little to no Roman material.²⁹³ At the site, a minor trail (Darb Arqub al-Baghla) branches westwards, its sides strewn with flint implements and shards predominantly dated to Pre-dynastic, Protodynastic, and Coptic periods.²⁹⁴ In contrast, the Alamat Tal road continues southeast, towards the area known as the Towers. Overlooking the Theban escarpment, two mud-brick towers erected under the Seventeenth Dynasty guarded the road's descent into the Nile Valley.²⁹⁵ The analysis of pottery remains strewn along the trail indicated the road was travelled from the pre-Dynastic period up to ca. 1000 BCE, with the greatest volume of traffic noted for the phase ranging from the reign of the 6th Dynasty to the New Kingdom period.²⁹⁶

As for Roman remains along the trail, TDRS teams found an access trail that approached the Alamat Tal road from the area situated west of southern Qamula. Along the road were found dry stone huts, temporary habitation structures, and watch-posts; most importantly, pottery scatters along the trail pointed to a measure of Roman-Islamic traffic on this trail.²⁹⁷ It appears the terminus of Alamat Tal road might have changed in the Roman period, with camel caravans preferring to descend into the Valley via the Qamula track instead of following the Pharaonic trail. As it is, Roman-era traffic has been confirmed on the stretch between Qamula and Gebel Tjauti, with a notable scarcity of Graeco-Roman remains on the latter site; it remains to be seen whether future surveys in the area uncover Roman material along the northern section of this trail (Gebel Qarn al-Gir–Gebel Tjauti).

6.7.3. *Darb Rayayna (Map 17)*

Darb Rayayna, a north–south crossing through the Qena Bend, originates in Hu (ancient Diospolis Parva) and strikes south-east-south towards al-Rizerqat (ancient Krokodilopolis);²⁹⁸ on its way, the trail follows the bed of a deep gulch, known as Khor Battaghah, its walls so steep that it effectively cleaves the Theban upland from the rest of the Western Desert.²⁹⁹ Several kilometres south, Darb Rayayna crosses an ancient linking trail going from the caravan trail junction at Gebel al-Qarn Gir to Darb al-Refuf and ultimately Kharga.³⁰⁰ Approaching the Nile Valley escarpment, the road goes past the ruins of a sizeable former Christian monastic complex at Apa Tyrannos. The area around the monastery abounds in Dynastic and Coptic graffiti, with several Demotic scribbles dated to the Persian period.³⁰¹ Finally, Darb Rayayna descends the Theban plateau in the vicinity of Naqb al-Rizerqat, disappearing in the cultivated fields.³⁰²

Averaging 4–5 metres in width, surveyed sections of the road are marked by conspicuous side windrows; good visibility of road shoulders may be the reason few alamat have been placed along its run. Numerous scribbles and pottery scatters on the sides demonstrate that Darb Rayayna was travelled at least since the Old Kingdom period, with ongoing traffic in the New Kingdom, Ptolemaic, Roman, Coptic, and Early Arab periods, with most surface shards dated to Late Roman/Coptic period.³⁰³ Significantly, Theban Desert Road Survey teams established that several access trails that branch off Darb Rayayna on its descent into the Nile Valley were first used only in the Roman period.³⁰⁴ Apparently, Roman-era caravans for some reason blazed new access trails, which would explain the conspicuous lack of Roman material at investigated sites by the main track.

6.7.4. *Darb Ba'irat linking road (Map 17)*

Darb Ba'irat, a minor linking trail, splits from the Farshut road in the middle of the Qena Bend plateau, turns south to follow the bed of Wadi al-Ba'ira and gently descends into the Nile Valley, reaching the border of the cultivated land about 1.5 kilometres south of Medinet Habu.³⁰⁵ Just like other roads in the region, Darb Ba'irat averages 4–5 metres in width, with side windrows preserved in some sections of the road. Pottery assemblages along the road indicate this trail was in use from the Second

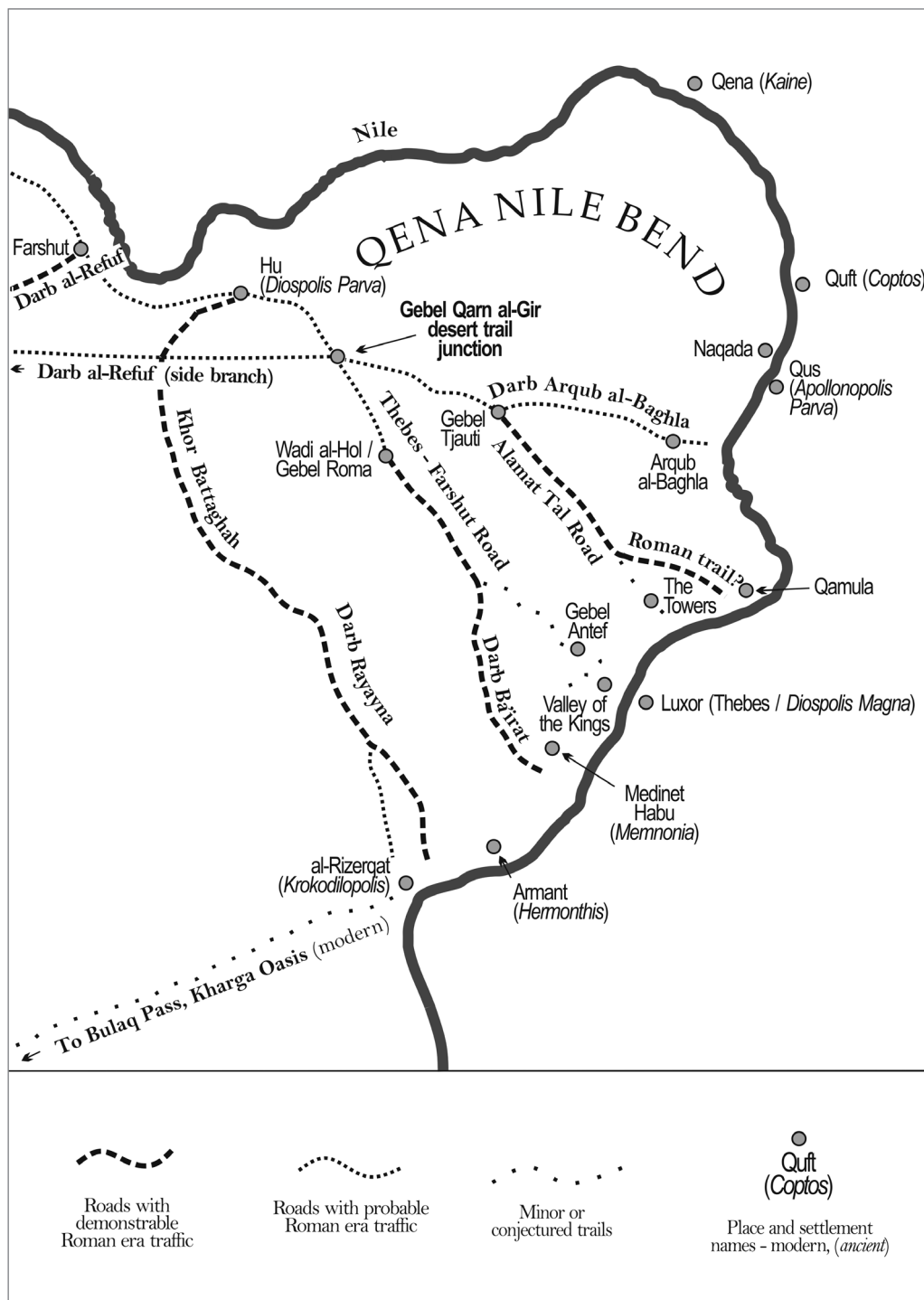


Fig. 6.7 Map 17 - Roads crossing the Qena Nile Bend

Map 17 – Roads crossing the Qena Nile Bend

Between Farshut and al-Rizerqat (*Krokodilopolis*), the Nile Valley curves in an elongated, western-facing arc: the area within the arc, known as the Qena Bena, abounds in remains of ancient roads, many of them indirectly linked to the necropoleis of Luxor (*Thebes/Diospolis Magna*). The hillocky and rough plateau encircled by the Qena Bend does not suit camels well, as these animals prefer to step on sandier surfaces. Accordingly, the main trails traversing the plateau were most travelled by the donkey caravans of the Dynastic period, with camel caravans subsequently blazing new, sandier access trails through the Theban escarpment; the latter are often easily datable to the Roman or Islamic period.

From the city of Hu (*Diospolis Parva*) several roads spread southeastwards like wheel spokes, cutting the Qena Nile Bend and reaching the sites on its other side. DARB RAYAYNA, abounding in Roman-era remains, leaves Farshut, passes through Hu (*Diospolis Parva*), and strikes south-east-south towards al-Rizerqat. The FARSHUT–THEBES ROAD, also known as the Road of the Horses, strikes southeast from Hu, passes an important caravan road junction at Gebel Qarn al-Gir and continues southeast to Western Thebes; a feeder trail known as DARB BA'IRAT branches off to the west and descends to the Valley near Medinet Habu. Roman traffic on the Road of the Horses is confirmed near Wadi al-Hol and on Darb Ba'irat.

At Gebel Qarn al-Gir begins the ALAMAT TAL ROAD, leading to the area west of Qamula; light Roman-era traffic has been confirmed for the Qamula–Gebel Tjauti section, but not for the remainder of the track. Its side branch, DARB ARQUB AL-BAGHLA, yielded pottery shards predominantly dated to the Pre-dynastic, Protodynastic, and Coptic periods.

Two feeder trails from Farshut and Gebel Qarn al-Gir merged into the track known as DARB AL-REFUF and led to Kharga Oasis via the eponymous Refuf Pass. Concrete evidence points to heavy Roman-era traffic on the Farshut-facing branch; the Roman traffic on the Gebel Qarn al-Gir branch is likely, but unconfirmed.

Maps and materials consulted: Morkot 1996, 91, fig. 4; Barrington Atlas (ed. Talbert 2000), map 77; Graeff 2005, map XIV, XV; Darnell 2002, 134, fig. 2; 2013, 222, fig. 1; Darnell and Darnell 2002, 4, fig. 1ab; 2006, fig. 2.

FARSHUT–THEBES ROAD (THE ROAD OF THE HORSES) (section 6.7.1): Farshut → Hu (*Diospolis Parva*) → Gebel Qarn al-Gir → Wadi al-Hol/Gebel Roma → [Darb Ba'irat branches off] → Gebel Antef → Valley of the Kings

DARB BA'IRAT (section 6.7.4): [separates from Farshut–Thebes road] → Medinet Habu

ALAMAT TAL ROAD (section 6.7.2): Gebel Qarn al-Gir → Gebel Tjauti → [road bifurcates] → [Pharaonic branch: → The Towers → The Nile Valley] | [Roman branch: → Qamula]

DARB RAYAYNA (FARSHUT–HU–AL-RIZERQAT) (section 6.7.3): Farshut → Hu (*Diospolis Parva*) → Khor Battaghah → al-Rizerqat (*Krokodilopolis*)

DARB AL-REFUF (section 6.6.1): Farshut [northern terminus] | Gebel Qarn al-Gir [southern terminus] → Wadi Samhud [branches converge] (not depicted) → Abu Ziyar (not depicted) → Tundaba (not depicted) → Refuf Pass (not depicted) → Kharga Oasis (not depicted)

Intermediate up to the Greco-Roman period, with the peak in the traffic volume in the Roman period.³⁰⁶ Interestingly, the increased volume of traffic on the trail somewhat correlates with the introduction of camels as beasts of burden in Egyptian desert transport. In Graeff's view, camel caravans travelling from Western Thebes to Hu/Farshut preferred the longer but gentler ascent of Darb Ba'irat to the shorter climb of the Farshut road, as feet of the camels passing through the rockier and rougher terrain on the Farshut road would be more prone to injuries.³⁰⁷

6.8. Roads linking Dunqul and Kurkur Oases with Syene, al Shabb, Selima, and Kharga Oases

In Roman Egypt, the stretch of the Nile Valley between Aswan (ancient Syene) and Maharraqa (ancient Hiera Sycaminos) was known as Dodecaschoenus, the Land of Twelve Miles and the southern limit of the Roman rule in Egypt. This section discusses desert trails traversing the hinterland of Dodecaschoenus, a quadrilateral sector of Western Desert with its limits at Aswan, Maharraqa, the southern tip of Kharga Oasis, and the al-Shabb waterhole. The backbone trail of the area, the Aswan–al-Shabb road links the Nile Valley to remote waterholes of Kurkur and Dunqul. Two other trails, Darb Bitan and Darb al-Gallaba, run north–south and respectively connect Farshut to Kurkur and Esna/Kom Ombo to Aniba/Qasr Ibrim in Nubia. Yet another trail connects the southern tip of Kharga to Qasr Ibrim in Nubia, passing through Bir Nakheila and Dunqul springs. Finally, Darb al-Deir/the Western Nile Bank road parallels the western flank of the Nile Valley, links Aswan to all major Roman forts of Dodecaschoenus, and terminates at Maharraqa (Hiera Sycaminos), the southernmost limit of Roman Egypt.

6.8.1. Aswan–Kurkur–Dunqul–al-Shabb road (Maps 18 and 19)

Southwest of the Kharga Oasis, a long road links Aswan to a small alum-rich depression of alShabb, running through Gebel Tingar quarries and Kurkur, Dunqul, and Bir Nakhlai waterholes. Most scholars agree that the Aswan–al-Shabb road is probably 'the Elephantine road' or 'ivory road' once travelled by Harkhuf, a Sixth Dynasty official of Merenre and Pepi II, during the second of his journeys to Yam.³⁰⁸ The Elephantine road originates opposite Aswan, on the western Nile bank. From there, the trail strikes west, winding its way through a granodiorite quarry complex, situated on steep hills overlooking the river.³⁰⁹

The quarries and hills of the Western Aswan hinterland have recently attracted the attention of surveyors from QuarryScapes Project (*Conservation of Ancient Stone Quarry Landscapes in the Eastern Mediterranean*), who explored the region between 2005 and 2013 and amassed extensive data concerning regional quarry transport roads and desert trails.³¹⁰ Desert exploration teams led by Per Storemyr *et consortes* found and mapped a dense network of quarry access roads at Gebel Tingar and Gebel Gulab. Surveyors investigated paved roads, cleared tracks, ramps, and slipways of types very similar to those found at Mons Porphyrites and Mons Claudianus.³¹¹ Recent investigations demonstrated West Aswan quarries were at the peak of their output during the New Kingdom period, with resurgence in activity during the Roman

period, Roman-era quarry roads in the area distinguishable by characteristic stone piles placed at regular intervals along their edges.³¹²

Apart from surveying quarry roads, QuarryScapes teams investigated two major long-distance trails that originate in the Gebel Tingar area. Darb al-Deir,³¹³ linking Aswan to Hiera Sycaminos at the border of Roman Egypt, is discussed in detail in section 6.8.4 of this book. Another trail, Sikket al-Agamiya ('the foreigners' road'), is a partially cleared trail that connects Aswan to Kurkur. Climbing sandy Wadi al-Tilal, the trail skirts Gebel Tingar from the north and strikes east.³¹⁴ The rocky outcrop of Gebel Tingar is particularly important to this study because of several inscribed Greek signatures, tentatively linked to desert travellers on Sikket al-Agamiya. Having studied and edited these inscriptions, Jean-Luc Fournet postulated they were left by stonecutters working in the adjacent quarries.³¹⁵ Conversely, Jan-Peter Graeff considered them within the context of adjacent Sikket al-Agamiya. In his view, caravaneers travelling westwards from Aswan customarily prayed for safe passage at a small Pharaonic shrine of Khnum at Gebel Tingar, leaving behind inscribed signatures and water jar shards.³¹⁶ Pieces of evidence recently amassed by QuarryScapes teams add considerable weight to both hypotheses. The shrine could have equally served stonecutters and caravaneers, although possibly not both groups at the same time.³¹⁷

Leaving the Gebel Tingar area, Sikket al-Agamiya first runs south-west-south through a hummocky terrain that evens out after 4–5 kilometres. At this stage, the trail is well-marked with windrows spaced about 3–4 metres apart; after 8 kilometres, windrows gradually disappear, and the cleared road becomes a camel-worn trail, marked by stone heaps along its run.³¹⁸ Twenty kilometres southwest of Aswan, Sikket al-Agamiya crosses Darb al-Gallaba, a desert trail that connects Esna and Kom Ombo to Qasr Ibrim (Primis) in Nubia.³¹⁹ In the 1930's, Murray visited the crossroads while returning from Kurkur and discovered an overturned sandstone stela dated to the 18th regnal year of an unknown pharaoh; the stela, tentatively ascribed by Murray to the Middle Kingdom period, bore a small carving of an archer and a prisoner – probably a warning to desert raiders against approaching Aswan.³²⁰ Proceeding west-south-west, the trail approaches the foothills of Gebel Garra and veers southwest to meet Sinn al-Kaddab escarpment,³²¹ where in 1997, Egyptian border guard patrols discovered another two stelae, respectively dated to the reigns of Tutankhamun and Seti I.³²² Darnell juxtaposed Sikket al-Agamiya with other stelae-lined roads, such as the Dashur road near Giza (section 6.2.2),³²³ arguing the road was once set with a chain of Middle and New Kingdom desert outposts that oversaw traffic in Lower Nubia and protected the Valley against incursions of desert tribes.³²⁴

Further southwest, the track arrives at the first oasis on the route. Kurkur, a wadi-oasis situated in a branching gully 55 kilometres west from the Nile, draws its water from two brackish waterholes fed by a local groundwater basin, not by deeper and sweeter Aeolian deposits that typically feed wells at larger oases.³²⁵ An important desert trail junction, the site abounds in pre-Dynastic and Dynastic remains. Yale Toshka Desert Survey (YTDS) surveyors found loci of concentrated Middle and New

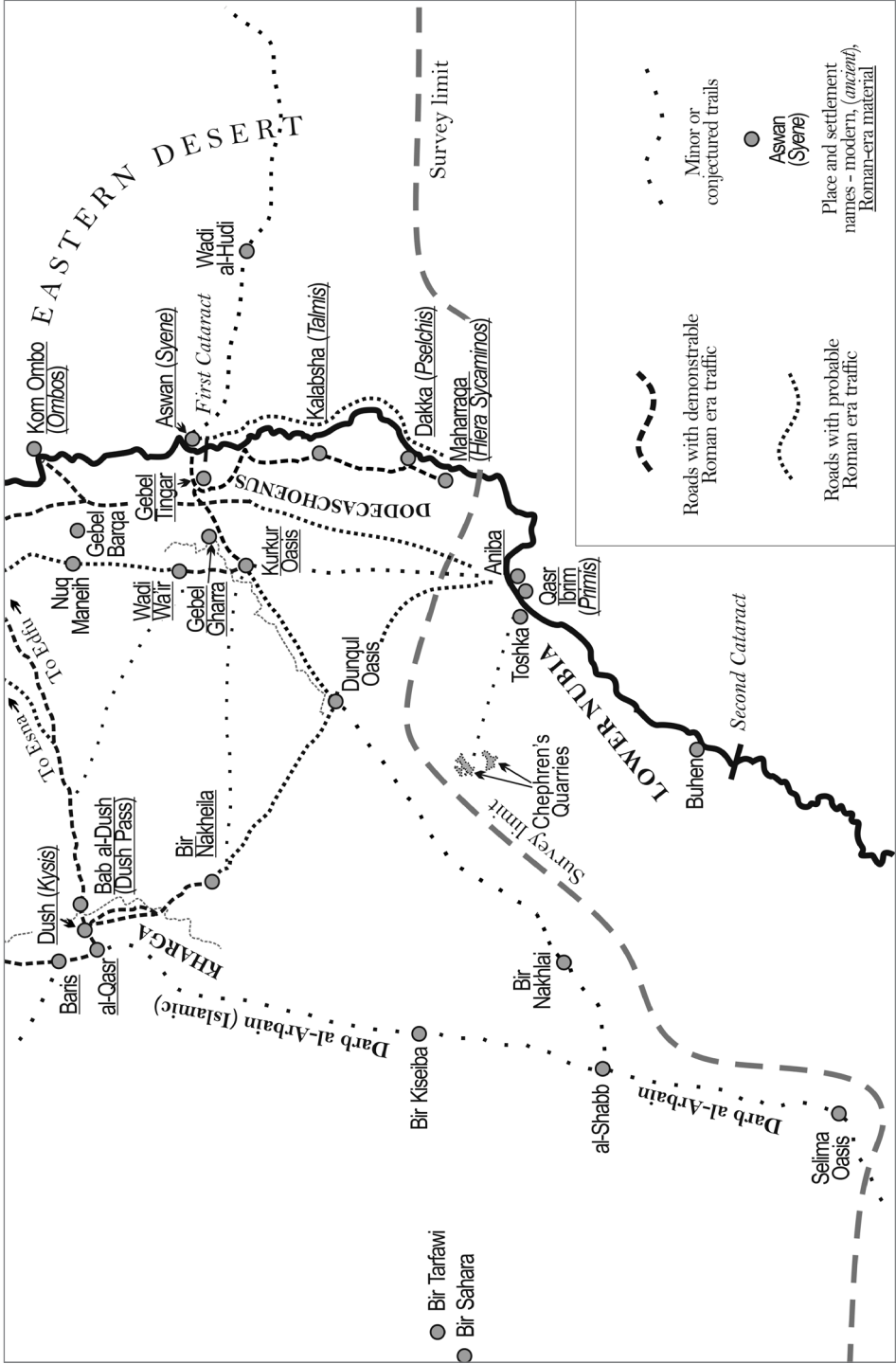


Fig. 6.8 Map 18 – Oases of Lower Nubia and Dodecaschoenus

Map 18 – Oases of Lower Nubia and Dodecaschoenus

On the southernmost limits of Egypt lies the stretch of the Nile Valley known as Dodecaschoenus, the Land of Twelve Miles delimited by Aswan (*Syene*) and Maharraqa (*Hiera Sycaminos*), the fortified border of the Roman rule in Egypt. The corridor between Egypt, Nubia, and Sub-Saharan Africa, Dodecaschoenus and its hinterland played a key role in the desert transport, linking the Nile Valley to oases and waterholes which lie to the west and south.

The following map depicts a tangle of desert trails traversing a quadrilateral sector of the Western Desert, with its limits at Aswan, Maharraqa, the southern tip of Kharga Oasis, and the al-Shabb waterhole. The backbone trail of the area, the ASWAN–AL-SHABB ROAD links the Nile Valley to remote waterholes of Kurkur and Dunqul. Roman traffic is likely for the initial section of this road (Aswan–Kurkur), but uncertain for further stages.

Two other trails, DARB BITAN and DARB AL-GALLABA, run north–south and respectively connect Farshut to Kurkur and Esna (*Latopolis*)/Kom Ombo (*Ombos*) to Aniba/Qasr Ibrim (*Primis*) in Nubia. Scarce Roman-era material was found at both roads, albeit with uneven distribution. Remains at Darb Bitan surfaced mainly between Wadi Wa'ir and Kurkur. In contrast, the material at Darb al-Gallaba appeared regularly along the northern section of the road between Esna and Aswan.

Three trails link the southern part of Kharga to the Nile Valley and beyond, weaving their way through passes in the steep escarpment around the oasis. The first one, DARB AL-DUSH, links the ancient village of Baris to the Nile Valley cities of Esna and Edfu (*Apollonopolis Magna*). Many epigraphical and archaeological pieces of evidence point to the large volume of Roman-era traffic on that trail. Another trail (DUSH–QASR IBRIM) connects the southern tip of Kharga to Qasr Ibrim in Nubia, passing through Bir Nakheila and Dunqul springs. We possess very limited evidence for Roman-era traffic on the stretch between Kharga and Bir Nakheila, while there is no evidence at all for the remainder of the road. The third road, DARB AL-ARBAIN, started in Asyut (*Lycopolis*), went through Kharga, leapfrogged between the oases of Bir Kiseiba, al-Shabb and Selima, and ended its run somewhere in Darfur. From the medieval period onwards, it was one of the main conduits through which luxury goods and slaves entered Egypt from the south. It remains doubtful that its entire length was travelled in the Roman period; despite many authors affirming that it had been so, no firm evidence has surfaced at roadside sites south of Kharga.

Finally, DARB AL-DEIR parallels the western flank of the Nile Valley, links Aswan to all major Roman forts of Dodecaschoenus, terminating at Maharraqa, the southernmost limit of Roman Egypt. Ample archaeological and literary evidence exists for Roman-era traffic along this road, including surviving roadside infrastructure, such as milestones.

Maps and materials consulted: Murray 1939, 98, 100, 102, 105; Morkot 1996, 85, fig. 1, 88, fig. 3, 91, fig. 4, 92; Barrington Atlas (ed. Talbert 2000), map 79, 80, 81; Darnell 2002, 133, fig. 1; 2004, 25, fig. 1; Graeff 2005, 116, 121–122, map V, IX, XII; Darnell and Darnell 2006; Storemyr *et al.* 2013, 401, fig. 2, 402, fig. 3, 407, fig. 11.

ASWAN–AL-SHABB ROAD (section 6.8.1): Aswan (*Syene*) → Gebel Tingar → Gebel Gharra → Kurkur Oasis → Dunqul Oasis → Bir Nakhlai → al-Shabb → [joins Darb al-Arbain]

DARB BITAN (FARSHUT–KURKUR) (section 6.8.2): Farshut (not depicted) → Nuq Maneih → Wadi Wa'ir → Kurkur Oasis

DARB AL-GALLABA (ESNA/KOM OMBO–ANIBA/QASR IBRIM) (section 6.8.2): Esna (*Latopolis*) [western terminus] (not depicted) | Kom Ombo (*Ombos*) [eastern terminus] → [branches converge] → Gebel Barqa → [along the plain of Dodecaschoenus] → Aniba | Qasr Ibrim (*Primis*)

DARB AL-DUSH (KHARGA–ESNA/EDFU) (section 6.6.3.): Baris → Dush (*Kysis*) → Bab al-Dush → [trail diverges] → Esna (*Latopolis*) | Edfu (*Apollonopolis Magna*)

KHARGA–QASR IBRIM (section 6.8.3): Dush (*Kysis*) → Bir Nakheila → Dunqul Oasis → Aniba | Qasr Ibrim (*Primis*)

DARB AL-ARBAIN (ASYUT–DARFUR) (section 6.10.3): Asyut (*Lykopolis*) (not depicted) → Baris → Bir Kiseiba → al-Shabb → Selima Oasis → Darfur (not depicted)

DARB AL-DEIR (ASWAN–MAHARAQQA) (section 6.8.4): Aswan (*Syene*) → Gebel Tingar → Kalabsha (*Talmis*) → Dakka (*Pselchis*) → Maharraqa (*Hiera Sycaminos*)

Kingdom material at Kurkur, some of which were tentatively associated with minor Pharaonic military outposts in the area.³²⁶ Pharaonic activities at the oasis were related to its strategic significance. To occupy Kurkur is to control all long-distance trails that link the oasis to Aswan (Sikket al-Agamiya), Farshut/Esna (Darb Bitan), Dunqul, the sites in the Upper Nile Valley (Sikket Dehmit/Sikket al-Umbarakab), and possibly Kharga via Bir Nakheila.³²⁷

One of these linking trails leaves Kurkur, ascends the Sinn al-Kaddab escarpment, and runs to the neighbouring oasis, Dunqul. Winding its way between distinctive hummock mounds, the high road between Kurkur and Dunqul yielded mainly artefacts left by prehistoric and pre-Dynastic travellers in the area, as well as small quantities of Dynastic material.³²⁸ At Dunqul, the trail from Aswan to al-Shabb crosses a perpendicular track leading from Dush (ancient *Kysis*) to Dunqul to Qasr Ibrim (ancient *Primis*) in the Nile Valley (section 6.8.3).³²⁹ Rich in prehistoric material, Dunqul consists of two springs. The larger, brackish one has access to grazing grounds, whereas the smaller one, three kilometres to the south, has sweeter water.³³⁰ After Dunqul, the southwestern camel track crosses a narrow belt of dunes and comes to Bir Nakhlai, a secluded spot with easily accessible water table;³³¹ finally, the trail terminates its run at al-Shabb, a small waterhole rich in alum deposits, where it joins Darb al-Arbain.³³²

Regrettably, it is difficult to gauge or pinpoint the Roman era traffic along the Aswan–al-Shabb trail, as its most recent surveyors, Yale Toshka Desert Survey teams, concentrated on prehistoric and pre-Dynastic remains alongside these desert trails. Small amounts of Roman material (mainly pottery scatters) have been noted and recorded at the roadside sites, but the material has been neither comprehensively described nor thoroughly discussed.³³³ In contrast, QuarryScapes teams carefully recorded and analysed Roman era remains, but their surveys covered an area that did

not reach beyond Kurkur. As it is, data extracted from YTDS and QuarryScapes field studies reveal the Aswan–Kurkur road was definitely travelled in pre-Dynastic and Dynastic periods. Notably, indirect evidence suggests the track saw at least a modicum of Roman era traffic (with Roman remains discovered in the vicinity of Kurkur),³³⁴ but further inquiries are necessary before its volume can be ascertained.³³⁵

6.8.2. *Darb Bitan and Darb al-Gallaba (Maps 16, 18, 19)*

Two nearly parallel north–south tracks traverse the Western Desert between southern Kharga and Dodecaschoenus, namely Darb Bitan and Darb al-Gallaba. Splitting from the Darb al-Refuf road near Farshut (section 6.6.1), Darb Bitan crosses the Rayayna desert near the Qena Nile Bend and strikes almost directly south to link Thebaid to Kurkur; in turn, Darb al-Gallaba connected Qasr Ibrim in Nubia to Kom Ombo and Esna.

Darb Bitan originates somewhere in the confused tangle of trails west of Farshut and strikes south towards Kurkur, crossing all trails that link Kharga to the Nile Valley.³³⁶ On its way south, the track converges with feeder trails coming from Esna and Edfu, the former one followed by G.W. Murray during his survey in the 1930s.³³⁷ Ninety kilometres south of Esna, the Darb Bitan enters the dry bed of Wadi al-Oshra and goes past eastern foothills of Gebel Barqa, an isolated limestone plateau rising sharply from the surrounding Gallaba Peditain; surveys in the region revealed numerous traces of prehistoric and Dynastic era activities.³³⁸ The most important site in the region, Nuq Maneih, lies between the track and Gebel Barqa to the west, about 50 kilometres from the Nile. An isolated clay pan, Nuq Maneih was formed when erosion blocked drainage lines in Wadi al-Oshra; the dammed gully became a seasonal lake that eventually filled with sediments washed down from surrounding cliffs during infrequent downpours.³³⁹ The deposited clay/marl mixture stores water relatively well and can even support limited vegetal growth; consequently, Nuq Maneih was often frequented by ancient desert travellers. Surveys of Murray and Yale Toshka Desert Survey teams uncovered several lacustrine sites that yielded numerous pre-Dynastic and Old Kingdom pottery shards and a variety of axes and grinding stones.³⁴⁰ However, of the greatest significance to this study is Wadi Wa'ir, the gorge slightly to the south of Nuq Maneih, where Darb Bitan ascends the Sinn al-Kaddab plateau on its way to Kurkur; YTDS teams found distinct traces of Roman era material in the gorge, demonstrating that at least the southern end of Darb Bitan was walked in that period.³⁴¹ South of Wadi Wa'ir, the road traverses Sinn al-Kaddab and descends into Kurkur through the so-called North Wadi, where it terminates.³⁴²

Darb al-Gallaba originates at the convergence of feeder trails coming from Esna and Kom Ombo, strikes south and links these Nile communities to Qasr Ibrim in Nubia.³⁴³ Resembling Darb Bitan in many aspects, Darb al-Gallaba heads south and skirts Gebel Barqa plateau from the east, paralleling its western twin road; surveys of the road stretching west of Gebel Barqa uncovered many formerly-busy roadside sites connected to caravan traffic, with abundant remains ranging from the proto-Dynastic to Roman period.³⁴⁴ The apparent volume and regularity of the traffic on Darb al-Gallaba becomes understandable when one considers the route's primary

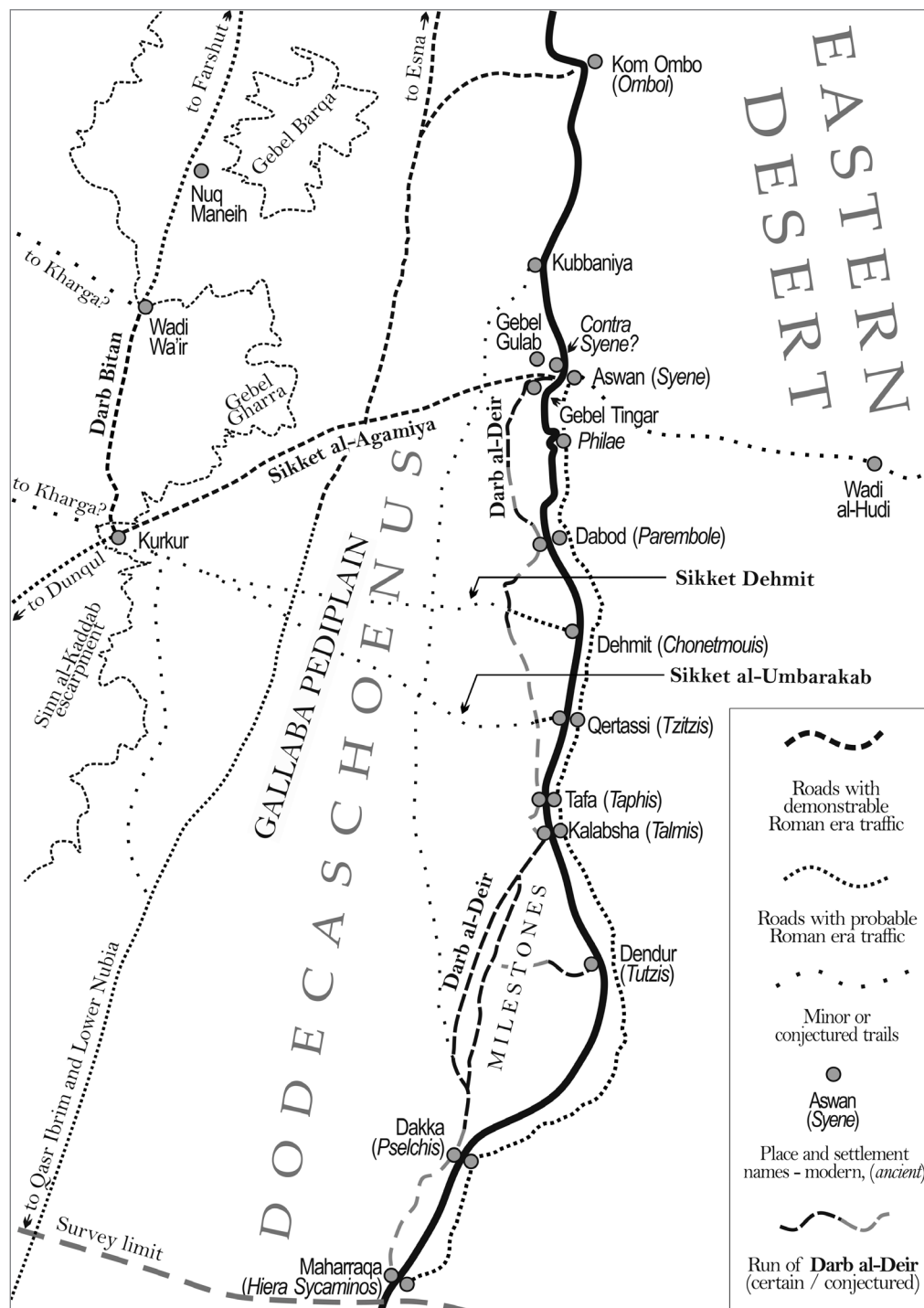


Fig. 6.9 Map 19 - Dodecaschoenus and Kurkur Oasis

Map 19 – Dodecaschoenus and Kurkur Oasis

The accompanying map depicts in greater detail the region of Dodecaschoenus, the Land of Twelve Miles delimited by Aswan (*Syene*) and Maharraqa (*Hiera Sycaminos*), the fortified border of the Roman rule in Egypt. Its main focus is on Gallaba Pediplain, a flat stretch of land between Sinn al-Kaddab escarpment to the west and the Nile Valley to the east.

Major trails in the region run north–south and connect Egypt to Lower Nubia, constituting an alternative travel corridor to the Nile Valley. The major military road in the region, DARB AL-DEIR, parallels the western edge of the Valley: it links Aswan to all the major Roman forts of Dodecaschoenus and terminates at Maharraqa, the southernmost limit of Roman Egypt. Ample archaeological and literary evidence exists for Roman-era traffic along this road, including surviving roadside infrastructure, such as milestones.

Two other north–south trails, DARB BITAN and DARB AL-GALLABA, connect Farshut to Kurkur Oasis and Esna (*Latopolis*)/Kom Ombo (*Ombos*) to Aniba/Qasr Ibrim (*Primis*) in Nubia respectively. Limited material evidence for Roman-era traffic was found on Darb Bitan between Wadi Wa'ir and on Darb al-Gallaba between Esna and Aswan. Finally, a minor desert road (SIKKET AL-AGAMIYA) joins Aswan to Kurkur, Dunqul, and al-Shabb: Roman traffic is likely for the initial section of this road (Aswan–Kurkur) but uncertain for further stages.

Darnell (2004, 25, fig. 1; 2006, fig. 2) and Storemyr (Storemyr *et al.* 2013, 401, fig. 2) mention other trails linking Kurkur to Kharga Oasis and the Nile Valley, including tracks from Kurkur that crossed Darb al-Deir and led to Dehmit (*Chonetmouis*) (Sikket Dehmit) and Qertassi (*Tzitzis*) (Sikket al-Umbarakab) in the Nile Valley. The easternmost sections of these trails probably linked Darb al-Deir to the Valley; however, no evidence for the Roman-era use of these trails has been found.

Maps and materials consulted: Murray 1939, 98, 100, 102, 105; Morkot 1996, 85, fig. 1, 88, fig. 3, 91, fig. 4, 92; Barrington Atlas (ed. Talbert 2000), maps 79, 80, 81; Darnell 2004, 25, fig. 1; Graeff 2005, 116, 121–122, map V, IX, XII; Darnell and Darnell 2006, fig. 2; Storemyr *et al.* 2013, 401, fig. 2, 402, fig. 3, 407, fig. 11.

ASWAN–AL-SHABB ROAD (SIKKET AL-AGAMIYA) (section 6.8.1): Aswan (*Syene*) → Gebel Tingar → Gebel Gharra → Kurkur Oasis → al-Shabb (not depicted)

DARB BITAN (FARSHUT–KURKUR) (section 6.8.2): Farshut (not depicted) → Nuq Maneih → Wadi Wa'ir → Kurkur Oasis

DARB AL-GALLABA (ESNA/KOM OMBO–ANIBA/QASR IBRIM) (section 6.8.2): Esna (*Latopolis*) [western terminus] (not depicted) | Kom Ombo (*Ombos*) [eastern terminus] → [branches converge] → Gebel Barqa → [along the Gallaba Pediplain] → Aniba | Qasr Ibrim (*Primis*) (not depicted)

DARB AL-DEIR (CONTRA ASWAN–MAHARRAQA) (section 6.8.4): Aswan (*Syene*) → Gebel Tingar → Dabod (*Parembolē*) → [side branch to Dehmit] → [side branch to Qertassi (*Tzitzis*)] → Tafa (*Taphis*) → Kalabsha (*Talmis*) → [side branch to Dendur (*Tutzis*)] → Dakka (*Pselchis*) → Maharraqa (*Hiera Sycaminos*)

function. A major north–south thoroughfare, Darb al-Gallaba crosses or converges with all feeder trails that link it to Aswan, Kurkur (Sikket al-Agamiya, West Aswan–Kurkur link, section 6.8.1),³⁴⁵ Dehmit (Sikket Dehmit),³⁴⁶ Qertassi (Sikket al-Umbarakab),³⁴⁷ Daraw,³⁴⁸ Qasr Ibrim, and Aniba.³⁴⁹ As such, it is the best direct land link between Thebaid, Dodecaschoenus, and Lower Nubia.

6.8.3. Kharga–Bir Nakheila–(Dunqul–Nile?) road (Maps 15, 16, 18)

An important linking trail connects Kharga Oasis to the Upper Nile Valley sites of Aniba and Qasr Ibrim, passing through Bir Nakheila and Dunqul waterholes. Leaving Kharga through a little-known southern pass next to Ain Khalifa spring,³⁵⁰ the track proceeds southeast for about 60 kilometres to Bir Nakheila, a remote waterhole about 150 kilometres northwest of Kurkur.³⁵¹ Archaeological and epigraphic evidence demonstrates Bir Nakheila was visited by ancient Egyptians travelling between Kharga and Lower Nubia. Surveys at this isolated site recorded hundreds of pre-Dynastic rock drawings, few Old/Middle Kingdom graffiti, and pottery heaps comprising significant amounts of local Libo-Nubian pottery, roughly contemporary to Egyptian pre-Dynastic, Old and Middle Kingdom wares; relevantly, a small but significant percentage of shards was dated to the Roman epoch, demonstrating at least this portion of the road link was active in that period.³⁵² Leaving Bir Nakheila, the trail continues 60 kilometres, passes through the Dunqul oasis,³⁵³ and continues southeast to Aniba, Qasr Ibrim, and other localities in the Valley. Certain pieces of pictographic evidence at these Lower Nubian sites hint at ancient Egyptians travelling from Kharga to the Valley via Bir Nakheila/Dunqul route. For instance, a New Kingdom rock drawing at Ibrim depicts a native of the Khargan village of Hibis.³⁵⁴ Regrettably, no similar depictions or inscriptions from the Roman period have come to light, but a measure of Roman material uncovered at Bir Nakheila implies a modicum of Roman-era traffic between this site and Kharga. Between Bir Nakheila, Dunqul, and the Nile Valley no Roman material was found, but, given Bir Nakheila's isolation, the site would probably not be the trail's terminus. Accordingly, I believe an argument can be made for the trail extending south- and eastwards to the Valley, probably via Dunqul.

6.8.4. Western Nile Bank/Darb al-Deir (Contra Syene–Hiera Sycaminos) road (Maps 18 and 19)

Darb al-Deir/Western Nile Bank road, a north–south trail that linked Aswan to all major riverine forts of Dodecaschoenus, is arguably the only Lower Nubian road specifically built by Romans and for the Roman-era traffic. Traversing the steep cliffs and wadis of the Upper Nile Valley, the run of Darb al-Deir was regrettably almost entirely submerged by the rising waters of the Nile after the Aswan Dam was completed in 1970. Opportunely, rescue survey teams led by James Hester, Phillip Hobbler, and James Russell managed to survey and explore the southern stretch of Darb al-Deir between Kalabsha (ancient Talmis) and Dakka (ancient Pselchis) before it was flooded.³⁵⁵ In the 2000s, QuarryScapes teams led by Per Storemyr surveyed and charted the northernmost section of this track between Western Aswan and the Aswan

International Airport; moreover, their thorough search of satellite images depicting the Aswan area revealed what they recognised as faint traces of yet another section of Darb al-Deir between Dabod (ancient Parembolē) and Dehmit (ancient Chonetmouis).³⁵⁶

Originating in the hummocky northern hinterland of Western Aswan, Darb al-Deir is a partially cleared desert of 10–12 m width, bordered by windrows made of heaped stones and pebbles.³⁵⁷ Weaving its way through the Gebel Tingar quarry complex, the trail first strikes west about 2.5 kilometres (paralleling Sikket al-Agamiya) and then swerves south to run parallel to the Valley; after about 10 kilometres, the road disappears in ditches and motorcar tracks surrounding the Aswan International Airport.³⁵⁸ Satellite images show the road subsequently swerved southeast towards Dabod (ancient Parembolē), a now-submerged site at the mouth of flooded Wadi Kurkur. South of Wadi Kurkur, Darb al-Deir reappears on satellite images and continues more or less south, crossing Sikket Dehmit track (to Dehmit in the Nile Valley); the road eventually disappears in the undulating landscape, but its general course up to that point suggested to the QuarryScapes team that it probably continued south towards Qertassi (ancient Tzitzis) and Kalabsha (ancient Talmis).³⁵⁹

QuarryScapes' surveys along the northernmost stretch of Darb al-Deir found traces of Roman-era activities at the roadside sites. As the road leaves the Gebel Tingar complex and enters the Gallaba Pediplain, it goes past numerous windshelters, cairns, and hilltop standing stones, often situated in context of Roman-era pottery scatters. In two such shelters, QuarryScapes surveyors found two incised sandstone slabs bearing characteristic patterns reminiscent of *ludus lantruncorum*, a type of Roman game board.³⁶⁰ The most relevant find was a ruined rectangular (6 × 3 m) hut at the edge of the Gallaba Pediplain; having analysed remains of the hut and sizeable quantities of Roman-era pottery found within, QuarryScapes surveyors have surmised that the hut was probably a Roman control post, built to oversee traffic on Darb al-Deir.³⁶¹ Strangely, no wheel marks or milestones were found along this stretch of Darb al-Deir, in direct contrast to its southern stretch surveyed by Hester, Hobler, and Russell.³⁶²

The rescue survey team led by these three archaeologists before the damming of the Nile discovered what could be termed the most important desert road in Dodekaschoenus securely dated to the Roman period: the Western Nile Bank road.³⁶³ A cleared, windrow-bordered track between Kalabsha (Talmis) and Dakka (Pselchis), the trail cut through the desert for at least 22 Roman miles (32.5 kilometres), marked by circular sandstone columns spaced at intervals of roughly one Roman mile; data drawn from the *Antonine Itinerary* suggested to Hester, Hobler, and Russell that the road might have actually been longer, with its putative origin in Tafa (Taphis) and terminus in Maharraqa (Hiera Sycaminos).³⁶⁴ As a desert track, the Western Nile Bank road is simultaneously a typical example and an exception. Roads in desert regions of the Roman Empire are often sinuous, unpaved tracks (*viae terrenae*) where surface rubble has been pushed aside to make windrows on the road edges and hard soil surface has been exposed.³⁶⁵ The Western Nile Bank road resembles other desert roads in that aspect, but it distinguishes itself by being furnished with a well-preserved

Table 6.7 Stations on the Syene–Hiera Sycaminos road according to *Itinerarium Antonini*

<i>Stations on the Syene–Hiera Sycaminos road according to Itinerarium Antonini (alternative name)</i>	<i>Distance in Roman miles</i>	<i>Ball's identification</i>	<i>Actual distance in Roman miles</i>
Contra Suenem (Contra Syene)	0	Aswan Gharb	0
Parembolē	16	Dabod	15
Tzitzī	2	Opposite Nag' Birein	2
Tafis	14	Teifa	19
Talmis	8	Kalabsha	6
Tutzis	20	Garf Husein	23
Pseltis (Pselchis)	12	al-Dakka	13
Corte	4	Qurta	4
Hiera Sicamino (Hiera Sycaminos)	4	Offedunya	4
IN TOTAL	80	IN TOTAL	86

series of regularly spaced circular milestones, of which only one is inscribed.³⁶⁶ In contrast to Nubia, typical milestones in other African provinces were cube-shaped and provided with inscriptions; moreover, in Roman Egypt, typical milestones are almost unheard of, with a notable exception of a milestone found in the vicinity of Heroonpolis in the Delta.³⁶⁷ Constructed sometime early in the period of Roman occupation of Dodecaschoenus (from 20 BCE to 297 CE), the Western Nile Bank road performed a primarily military function, facilitating deployment of troops to Western bank Nubian fortlets.³⁶⁸ QuarryScapes surveyors strongly believe the Western Nile Bank road is in fact the southern section of Darb al-Deir;³⁶⁹ similarities in their width and construction appear to support their hypothesis, but it has not been convincingly explained why one section of the same road would abound in milestones and another would be completely devoid of them.³⁷⁰

The *Peutinger Map* does not discriminate between roads on the eastern and western Nile bank, mentioning only the road's termini (Syene and Herasicamina [Hiera Sycaminos]) and one intermediate station, Spelci (Pselchis); notably, it places Pselchis and Hiera Sycaminos on the eastern bank of the Nile, whereas in reality, they lie on its western bank.³⁷¹ In contrast, the *Antonine Itinerary* records all significant road stations and distances between them with a good degree of accuracy, although Ball's identifications have since been partially corrected.³⁷²

6.9. Roads between major oases

Notwithstanding the great importance of road connections between oases and the Nile Valley sites, inter-oasis trails were often the safer and more convenient alternative to long-distance trails directed towards the Nile; leapfrogging from one waterhole to another would often be less demanding than crossing the vast and rugged Limestone

Plateau in a single journey. Two such inter-oasis trails left Siwa, passed through al-A'reg oasis cluster, and diverged, with one going east-south-east to Bahariya and another one southeast to Farafra. Similar tracks linked Farafra to Bahariya and Dakhla; in addition, no less than three trails connected Dakhla to Kharga, showcasing the degree of interconnectedness between these two lands, once jointly known as the Great Oasis.

6.9.1. Roads through al-A'reg oasis group

It has been mentioned that only one trail, Masrab al-Muhashas, directly linked Siwa to the Nile Valley. Nonetheless, there might have been other, rarely trodden tracks that headed for the oases of Bahariya and Farafra, thus indirectly connecting the Ammonian district to Egypt proper. To cross waterless salt pans and dunes southeast of Siwa was – and, to a degree, still is – a hazardous undertaking. After a few days, ancient travellers would have to visit a spring to replenish their water supplies; conveniently, a number of small oases pepper the southwestern edges of Qattara Depression.

120 kilometres southeast of Siwa, one finds a cluster of four miniscule oases, called the al-A'reg Group. Moving from the northwest to southeast, one encounters al-A'reg Oasis, then Bahrein Oasis, Nuwemisa Oasis, and finally Sitra Oasis. Today, these waterholes are little more than mosquito-infested, brackish, shallow lakes, with steep escarpments enfolding al-A'reg from the southwest and Bahrein, Nuwemisa, and Sitra from the north.³⁷³ A number of palm tree groves grow at the edge of briny lakes.³⁷⁴ Local springs yield water of variable quality. Sitra and Nuwemisa mostly have heavily mineralised water – with the exception of a hidden sweet spring at Sitra³⁷⁵ – but al-A'reg and Bahrein Oasis' supply is adequate and of good quality.³⁷⁶ With the notable exception of Sitra, all oases exhibit visible traces of having been inhabited in Classical Antiquity, with niches of rock-cut caves and tombs still extant.³⁷⁷ In the case of these sites, one can correlate better water quality with more sizeable human occupations. Out of four oases, al-A'reg and Bahrein have the best water and the most visible traces of ancient occupation.³⁷⁸

Of these two, the greatest amount of Dynastic and Graeco-Roman remains has been uncovered in al-A'reg.³⁷⁹ All visitors to the al-A'reg oasis have noted numerous tombs cut in the limestone escarpments; the most recent survey by Kuhlmann specify their number at 86.³⁸⁰ In some tombs, walls were decorated with simple paintings. One may enumerate religious depictions of Nut, Osiris, Isis, and Anubis, rural scenes with palms and animals, plus a single inscription painted in the Libyan script.³⁸¹ Gerhard Rohlfs, one of the first visitors to al-A'reg, claimed he found remains of columns and marble-covered floor in a ruined structure he identified as a circular temple.³⁸² Sadly, no subsequent visitors could find it, as it had probably been covered by moving dunes.³⁸³ Another artefact found in al-A'reg that points to the Graeco-Roman presence is a tablet inscribed in Greek, recording a list of local personal names.³⁸⁴ Further archaeological surveys in the region could uncover more traces of erstwhile inhabitants.

Situated 30 kilometres south-south-east of al-A'reg Oasis, Bahrein Oasis is simultaneously similar and dissimilar to other oases in the group. Like Nuwemisa and

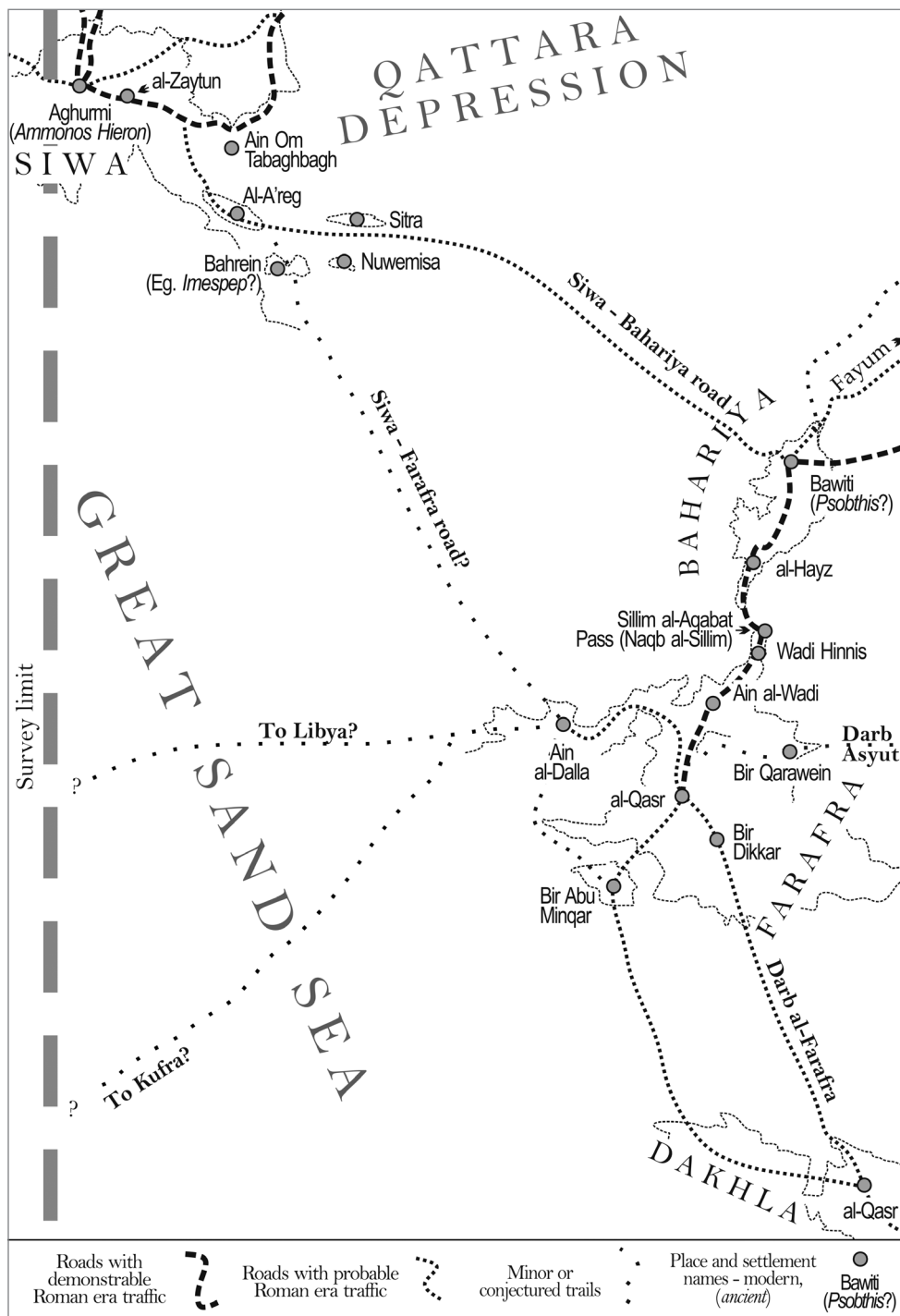


Fig. 6.10 Map 20 - Siwa, Bahariya, and Farafra Oases

Map 20 – Siwa, Bahariya, and Farafra Oases

In the central part of the Western Desert, one finds three major oases, Siwa, Bahariya, and Farafra, broad water-giving depressions bordering the Egyptian Limestone Plateau to the east and the Great Sand Sea to the west. Depicted together on this map due to their relative proximity, three oases nevertheless differed very much in terms of their Roman-era economy and transport links. Bahariya had close ties to the Nile Valley and was governed from al-Bahnasa (*Oxyrynchus*). Siwa mostly gravitated towards the Mediterranean and Libya. Remote Farafra yielded very little Roman material whatsoever, the majority of artefacts coming from its agricultural communities clustered in Wadi Hinnan.

These differences in trade and settlement patterns greatly influenced traffic between the oases and the Nile Valley. From Bahariya, well-documented Roman-era roads led to *Oxyrynchus* (DARB AL-BAHNASAWI) and Fayum (DARB AL-RAYAN). From secluded Farafra, only one road (DARB ASYUT) runs to the Valley, but no evidence came to light for its Roman – or ancient – use. It appears that Farafra depended on Bahariya for its connection to the Valley. From Siwa, Roman-era traffic went equally to Libya, the Mediterranean (MASRAB DIQNASH and MASRAB AL-ISTABL) and the Nile Valley (MASRAB AL-MUHASHAS), these trails discussed in greater detail on Maps 11 and 13.

Local differences also influenced the inter-oasis traffic. In the Roman period, Farafra's most travelled road connected it to Bahariya (FARAFRA-BAHARIYA TRAIL). Two other trails led from Farafra to Dakhla, one via Bir Dikkar (DARB AL-FARAFRA), another via Bir Abu Minqar. No evidence surfaced for their use under the Roman administration, but it appears likely that they saw some local traffic. It has been speculated that Farafra had road links to the Siwa Oasis, Libya, and Kufra, running past the remote waterhole of Ain al-Dalla and into the Great Sand Sea. No reliable data has surfaced to support these claims. Between Bahariya and Siwa an ancient route (DARB AL-BAHARIYA/DARB AL-SIWA) ran via the al-A'reg oases cluster, where traces of Graeco-Roman settlements have surfaced; Darb al-Siwa was probably used only infrequently, owing to rough terrain, marshes, and salt pans on the road.

Maps and materials consulted: Jennings-Bramly 1902, 73–75, map; Giddy 1987, map I; Barrington Atlas (ed. Talbert 2000), maps 73, 75, 77, 79; Graeff 2000, 61–67, maps VI, XVI, XVII, XVIII; Jackson 2002, 156, map 4; Eichhorn *et al.* 2005, 215, fig. 1; Thissen 2013, 396.

DARB AL-BAHNASAWI (BAWITI-AL-BAHNASA) (section 6.4.2): Bawiti (*Psobthis?*) → al-Harra → al-Bahnasa (*Oxyrynchus*)

DARB AL-RAYAN (section 6.4.1): Bawiti (*Psobthis?*) → Gebel Ghorabi (not depicted) → Wadi Rayan (not depicted) → [trail bifurcates] → [northern branch:] → Qasr Qarun (*Dionysias*)/Watifa (*Philoteris*) (not depicted) | [southern branch:] → Umm al-Baragat (*Tebtunis*)/Ihnasya al-Medina (*Herakleopolis Magna*) (not depicted)

DARB ASYUT (FARAFRA-NILE VALLEY) (section 6.5.1): al-Qasr (Farafra) → Bir Qarawein → [across the Limestone Plateau] → Beni Adi (not depicted)

DARB AL-FARAFRA (DAKHLA-FARAFRA) (section 6.9.3): al-Qasr (Dakhla) → Bir Dikkar → al-Qasr (Farafra)
DAKHLA-FARAFRA ROAD (section 6.9.3): al-Qasr (Dakhla) → Bir Abu Minqar → al-Qasr (Farafra)

FARAFRA-BAHARIYA ROAD (section 6.9.2): al-Qasr (Farafra) → Ain al-Wadi → Wadi Hinnis → Sillim al-Aqabat Pass → al-Hayz → Bawiti (*Psobthis?*)

SIWA–BAHARIYA ROAD (DARB AL-SIWA/DARB AL-BAHARIYA) (section 6.9.1.1): Aghurmi (*Ammonos Hieron*) → al-Zaytun → al-A'reg → Sitra → Bawiti (*Psobthis?*)

FARAFRA–SIWA (?) (section 6.9.1.2): al-Qasr (Farafra) → Ain al-Dalla → Bahrein (*Imespep?*) → al-A'reg → [joins Siwa–Bahariya road]

FARAFRA–LIBYA (??) (section 6.10.2): al-Qasr (Farafra) → Ain al-Dalla → Libya?

Sitra, Bahrein is nestled between rocky cliffs to the north and encroaching dunes to the south. Unlike al-A'reg, Nuwemisa and Sitra, it does not lie directly on the road linking Siwa to Bahariya, and consequently, very few travellers in the region visited it,³⁸⁵ what is more, Bahrein's water distinguishes itself by being of even better quality than that of al-A'reg.³⁸⁶ Bahrein Oasis has been long known as a site where several square-cut tombs are found, superficially similar to those of al-A'reg, but smaller and without paintings;³⁸⁷ de Cosson hypothesised the tombs might be Ptolemaic in date.³⁸⁸ It was not until 2003 that an Italian archaeological mission working in Bahrein uncovered ruins of a 30th Dynasty temple dedicated to Nectanebo I, with an adjacent hall probably added in times of the Ptolemies; finds demonstrate the Bahrein oasis was densely occupied in Dynastic Egypt – when it could have been known as *Imespep* – and Graeco-Roman periods.³⁸⁹ Sadly, the same cannot be said for Nuwemisa, where until now only smaller rock-cut tombs have been found in the escarpment to the north of the lake;³⁹⁰ in turn, Sitra has no traces of ancient habitation.³⁹¹ Yet, one should reserve judgement until proper surveys in the region can be carried out.

6.9.1.1. *Darb al-Siwa/Darb al-Bahariya (Siwa Oasis–Bahariya Oasis) (Maps 13, 14, 20)*

It is now known there was an ancient route linking Siwa to Bahariya Oasis that ran 350 kilometres and went via the al-A'reg oases cluster.³⁹² The trail started in the East Siwan village of al-Zaytun,³⁹³ continued southeast towards oases of al-A'reg, Nuwemisa, and Sitra,³⁹⁴ and descended into Bahariya. The trail, called *Darb al-Siwa* in Arabic,³⁹⁵ was probably used only occasionally, owing to rough terrain, marshes, and sebkhas on the road.³⁹⁶

Today, it is fairly certain which waterholes *Darb al-Siwa* ran through, with two exceptions. First, Wagner postulated that, after leaving al-Zaytun, *Darb al-Siwa* went via Ain Om Tabaghabagh, a small, damp depression where Roman tombs have supposedly been found.³⁹⁷ However, it should be noted that Wagner's proposal is based on shaky foundations. Tabaghabagh waterhole, an elongated depression stretching 15 kilometres on the east–west axis, lies between two escarpments that encompass it from north and south. By the southern cliff, a group of springs feeds their water into a marsh in the centre; to the north, a branch of Masrab al-Muhashas winds in front of the northern cliff face that tumbles into the Qattara Depression. Travellers on *Darb al-Siwa* would have to brave the steep cliff before drinking of Tabaghabagh springs; conversely, those wandering on Masrab al-Muhashas branch

would only need to walk for a while on the flat ground. Furthermore, it should be stressed that the so-called Roman tombs of Tabaghabagh have not been mentioned by any other authorities on Western Desert archaeology. The most recent survey of this area by Aldumairy mentions only ruins of an undated building.³⁹⁸ The original source on tombs, Leclant, has learned of their discovery from Egyptian press, but he noted the story in press was somewhat incoherent, and no further research has been conducted.³⁹⁹ Wagner repeats Leclant's words, but without his caveats;⁴⁰⁰ subsequently, no other author mentions that particular Roman necropolis. Granted, it is possible that Ain Om Tabaghabagh was inhabited in the Roman period, but a claim that it was part of the Darb al-Siwa waterhole chain is unsubstantiated. As for the other controversial statement, Fakhry wrote that Darb al-Siwa went through Bahrein Oasis;⁴⁰¹ nonetheless, his claim appears to be unfounded. All other authorities note that Darb al-Siwa actually veers off Bahrein Oasis and runs 12 kilometres north of it;⁴⁰² consequently, most European explorers have not noticed this forlorn waterhole.⁴⁰³ Probably, some of those travelling on ancient Darb al-Siwa made a detour south to Bahrein; still, to suggest it was an integral part of that route is an oversimplification.

6.9.1.2. Siwa Oasis-Farafra Oasis (*Maps 15 and 20*)

There could have been an even less-trodden route that would go through Bahrein and turn southeast to link Siwa with Farafra;⁴⁰⁴ unfortunately, it is weakly attested, with no literary testimonies and archaeological finds pointing to it being used in the Roman period. Those few modern authors who mention it agree this trail separated off Darb al-Siwa somewhere south of al-A'reg, entered Bahrein Oasis from the north,⁴⁰⁵ traversed southeast through the inhospitable stretch of the desert west of the Great Sand Sea, and finally arrived at Ain al-Dalla, a small waterhole 70 kilometres northwest of Farafra.⁴⁰⁶ A minor crossing of desert trails leading to Libya, an unexcavated oasis of Ain al-Dalla was probably inhabited in Roman and Byzantine periods.⁴⁰⁷ In the oasis, modern visitors noticed remains of two 'Roman' houses;⁴⁰⁸ moreover, Christian inscriptions in Greek and a bronze cross dated to the 5th or 6th century CE were found in the vicinity.⁴⁰⁹ It remains unknown whether the discussed trail was used in the Roman period, although Giddy hypothesises it might have been an early trade route between Farafra and Siwa in the First Intermediate Period.⁴¹⁰

6.9.2. Farafra-Bahariya trail (*Maps 14, 15, 20*)

An easy-going and well-watered trail links Farafra to Bahariya. About 185 kilometres in length, it can be travelled in four days with a camel and five with a donkey.⁴¹¹ Originating in the Bahariyan village of Bawiti (tentatively identified with ancient Psobthis), the trail strikes south-west-south for 40 kilometres and arrives at al-Hayz, a once thriving agricultural community comprising several populous hamlets.⁴¹² Preliminary findings of Czech archaeological surveys at al-Hayz indicate this forlorn waterhole was rarely visited throughout Pharaonic and Ptolemaic periods; however,

layers dated to the beginning of the Roman period (1st–2nd century CE) demonstrate al-Hayz rapidly developed under Romans, with its *floruit* in the 3rd–5th century CE.⁴¹³ Currently, it is not known whether the site was first settled in the Early Roman period or all traces of pre-Roman occupation were covered by shifting sands;⁴¹⁴ if the former is true, Roman annexation of Egypt would coincide with and possibly bring about the development of watering sites alongside the Bahariya–Farafra trail. Southwest of the al-Hayz complex, the road ascends the Limestone Plateau through the Sillim al-Aqabat pass and then runs about 90 kilometres towards its opposite, Farafran edge; on its way, the trail goes past numerous pottery scatters thought to date from Pharaonic or Graeco-Roman periods.⁴¹⁵

As it approaches the Farafra Oasis, the track descends into the spacious Wadi Hinnis valley and arrives at a group of three springs (Ain Khadra, Ain Maqfi, and Ain al-Serw) jointly known as Ain al-Wadi. Surveys undertaken by University of Viterbo teams in the Ain al-Wadi area uncovered traces of small Roman farming communities that grew around springs; to my knowledge, to this day, they have not been excavated.⁴¹⁶ Ain Khadra and Ain Maqfi sites, rich in Roman and Byzantine pottery shards, were tentatively identified by Viterbo teams as roadside stops on the caravan routes that linked Farafra to Bahariya; a more westerly community drawing its water from Ain al-Serw probably hosted travellers on one of the side tracks that connected Farafra to Asyut.⁴¹⁷ Leaving the valley, the trail descends into the Farafran hollow and – about 40 kilometres southwest of Wadi Hinnis – it finally arrives at al-Qasr.⁴¹⁸

6.9.3. *Darb al-Farafra (Farafra Oasis–Dakhla Oasis) (Maps 15, 20, 21)*

A 200-kilometre-long trail once crossed in about four days, known as *Darb al-Farafra* in Dakhla and *Darb al-Dakhla* in Farafra, stands as the most direct crossing between the Great and Small Oasis.⁴¹⁹ Striking 35 kilometres south-east-south from Farafran al-Qasr, the trail first follows the broad bed of Wadi al-Umm Mohammad and eventually arrives at a copse of dead palm mains that surround the sand-choked well, named Bir Dikkar.⁴²⁰ Further ahead lies the undulating gravel plain of the Limestone Plateau, occasionally broken by imposing dune chains. Jackson's survey along the road discovered sections of a windrowed trail resembling those found along *Darb al-Tawil's* run, with small amounts of badly eroded pottery strewn along the track. Negligible amounts of tell-tale water jar shards at the road suggested to Jackson the trail was either sporadically travelled in the Graeco-Roman Antiquity, or the ancient run of the road has been swallowed by wandering dune chains; hopefully, future surveys in the area will clarify which one of these two assumptions is correct.⁴²¹ About 140 kilometres south-east-south from Bir Dikkar, the trail descends into the Dakhlan hollow through the precipitous, sand-choked Bab al-Qasmund pass and enters Qasr Dakhla, where it terminates.⁴²²

Another little known 300-kilometre-long trail between Farafra and Dakhla first strikes southwest from Farafran al-Qasr and goes past three sand-choked,

uninhabited springs (Ain Sheikh Murzuk, Ain al-Agwa, Ain Khalif); a traveller then arrives at Bir Abu Minqar, a desolate spring at the very edge of Roman Egypt.⁴²³ The abandoned site bears traces of its former inhabitants, with two well shafts and two ruined brick buildings tentatively pointing to the site's possible occupation in the Roman period.⁴²⁴ The Abu Minqar trail subsequently veers southeast, skirts the edge of the Limestone Plateau, and gradually descends into the Dakhlan depression, terminating its run at Qasr Dakhla.⁴²⁵ Currently, it remains unknown whether this trail was travelled in the Roman period, as no thorough survey has been conducted at Bir Abu Minqar watering spot; nonetheless, certain analogies between Abu Minqar and Ain al-Wadi spring sites (section 6.9.2) indicate this might have been the case.

6.9.4. Three Dakhla–Kharga roads (*Darb al-Ghubbari*, *Darb Ain Amur*, *an unnamed northern track*) (Maps 15 and 21)

Three roughly parallel desert trails link the easternmost part of the Dakhla Oasis to the northwestern flank of Kharga. The southernmost one, 190-kilometre-long *Darb al-Ghubbari*,⁴²⁶ first strikes south from the Dakhlan village of Teneida, and after 4.5 kilometres, it arrives at Ain al-Barabi spring.⁴²⁷ The track soon veers southeast and circumvents cliffs of the Abu Tartur Plateau from the south, going past numerous rocky outcrops scribbled with prehistoric petroglyphs and Dynastic, Greek, Coptic, and Arabic graffiti.⁴²⁸ The 140-kilometre-long stretch of the trail traversing the waterless, dusty, dune-choked plain south of the Abu Tartur Plateau was once marked by a line of 1.5-metre-high *alamat*,⁴²⁹ as for the rest of the road infrastructure, at least four Romano-Arabic watering stations (marked by large pottery heaps or *mahattas*) provided the Graeco-Roman travellers on *Darb al-Ghubbari* with water.⁴³⁰ Mid-way, *Darb al-Ghubbari* splits, with an abandoned trail branch veering southeast towards Baris in the southern part of Kharga⁴³¹ the side trail probably being an extension of the desert road that strikes east from Baris to link it to Edfu and Esna in the Nile Valley (section 6.6.3). In contrast, the main track deviates northeast and wends its way through dune chains that cover the plain south and southeast of Abu Tartur. Coming within reach of Naqb al-Ghubbari, the entrance pass to Kharga, *Darb al-Ghubbari* arrives at the Ain Teraugi spring, situated about 5 kilometres west of Kharga (ancient Hibis), and then comes into the town.⁴³² A flat and easy-going trail, *Darb al-Ghubbari* is the trail of choice for caravans bearing heavy loads; Roman shards found at the watering stations prove this track was furnished with new watering stations sometime during the Roman era, probably to facilitate what would be a waterless crossing in an extremely dusty environment.⁴³³

Another trail, the 180-kilometre-long *Darb Ain Amur*, does not skirt the Abu Tartur Plateau from the south but crosses straight over it; in contrast to waterless *Darb al-Ghubbari*, this trail goes past an abundant well (Ain Amur) conveniently situated mid-way.⁴³⁴ Leaving Teneida, *Darb Ain Amur* ascends the plateau via Naqb Tineida ('Teneida Pass') and runs past several pottery dumps/former watering stations. Two

Map 21 – Dakhla and Kharga Oases

Situated close to each other, Dakhla and Kharga Oases are often seen as a single unit: in the Graeco-Roman period, they were jointly known as the Great Oasis (*Oasis Magna* [Lat.]/*Megale* [Gr.]) in contrast to Bahariya, known as the Small Oasis (*Oasis Parva* [Lat.]/*Mikra* [Gr.]). The Greeks referred to Kharga and Dakhla in regard to their relative position to the Sahara: Kharga was known as an ‘exterior’ oasis (*he Exotero*) and Dakhla as an ‘interior’ oasis (*he Esotero*).

At least two roughly parallel desert trails link the easternmost part of the Dakhla Oasis to the northwestern flank of Kharga. Between two oases rises the imposing Abu Tartur Plateau, an obstacle to be navigated in the inter-oasis traffic. The southern road, *DARB AL-GHUBBARI*, circumvents Abu Tartur from the south, linking the Dakhlan village of Teneida to the Khargan town of Hibis. The northern trail, *DARB AIN AMUR*, ascends and traverses the Plateau, going past an abundant well (Ain Amur), where it bifurcates; one arm strikes southeast towards Hibis, whereas another continues east towards Late Roman fortified sites of Ain Umm Dabadib and Ain Labakha. Both tracks subsequently yielded ample evidence of Roman-era traffic. Corinna Rossi and Salima Ikram have recently conjectured that yet another trail split off *Darb al-Tawil*, detoured Abu Tartur from the north, cut through the dune chain of Ghard Abu Muhariq and descended into Kharga near the so-called Northern Outpost. If it existed, it has since been obfuscated by shifting sands.

Several trails link the Great Oasis to the Nile Valley. Trails from Kharga to the Valley are plotted and discussed in greater detail on Map 16. From Dakhla, a road known as *DARB AL-TAWIL* ran northeast, linking Balat and al-Qasr to Beni Adi and Asyut (*Lycopolis*). By this road one finds a Ptolemaic military-watering site of Abu Gerara and numerous Late Roman pottery dumps. A feeder branch of *Darb al-Tawil*, *DARB AL-KHASABI*, funnelled traffic originating from the al-Qasr site in Dakhla.

Other tracks linked Dakhla and Kharga to other oases and sites beyond Egypt. From Dakhla, two trails led to Farafra, one via Bir Dikkar (*DARB AL-FARAFRA*), another via Bir Abu Minqar. No evidence surfaced for their use under the Roman administration, but it appears likely that they saw some local traffic. *ABU BALLAS TRAIL*, arguably the earliest long-range desert trail in Ancient Egypt, linked the Dakhla Oasis to Gilf Kebir Plateau and regions further south. Furnished with pottery water caches, this important road was early Egypt’s (ca. 2200 BCE) gateway to Central Africa. Intermittently used up to the Islamic period, the watering sites of the Abu Ballas trail occasionally yield small amounts of Roman pottery, the furthest assemblage of Roman shards found at site Jaqub 00/23, 173 kilometres from Dakhla (Hendrickx, Förster and Eyckerman 2013, 360–362, 362, fig. 28). It remains uncertain whether deposits of Roman jugs on the Abu Ballas trail confirm that it was plied under the Romans; alternatively, the deposits could have simply operated as local water infrastructure, attracting multidirectional desert traffic from termini as yet unknown to us. So far, no Roman-era sites have been found southeast of Jaqub 00/23.

Maps and materials consulted: Giddy 1987, map I; Morkot 1996, 91, fig. 4; Barrington Atlas (ed. Talbert 2000), map 79; Graeff 2000, maps X, Xb, XVIII, XIX, XX, XXI; Darnell and Darnell 2002, 4, fig. 1b; Eichhorn *et al.* 2005, 215, fig. 1; Bubenzer and Bolten 2013, 63, fig. 1, 73, fig. 10; Darnell 2013, 222, fig. 1; Förster 2013, 300, fig. 5, 313, fig. 37; Hendrickx, Förster and Eyckerman 2013, 343, tab. 1, 340, fig. 1; Riemer and Förster 2013, 38, fig. 7; Rossi and Ikram 2013, 275, fig. 9.

Kharga–Nile connections (see Map 16 for details): Kharga–Asyut road (section 6.5.3); Sohag road (section 6.6.1); Kharga–Farshut (Darb al-Refuf) (section 6.6.1); Kharga–Girga/Abydos (Darb al-Deir) (section 6.6.1); Kharga–Esna/Edfu road (section 6.6.3)

DARB AL-TAWIL (BALAT–BEN ADI) (section 6.5.2): Balat → Halfet al Bir → Balat Pass → [branch from al-Qasr converges] → Abu Gerara → Naqb Shusina → Beni Adi (not depicted)

DARB AL-KHASABI (section 6.5.2): al-Qasr → [follows Darb al-Tawil] → [turns northwards] → [rejoins Darb al-Tawil]

DARB AL-GHUBBARI (section 6.9.4): Teneida → Kharga (*Hibis*)

DARB AIN AMUR (section 6.9.4): Teneida → Naqb Tineida → Ain Amur → [trail bifurcates] → [northern branch:] → Ain Umm Dabadib → Ain Labakha | [southern branch:] → Kharga (*Hibis*)

DARB AL-FARAFRA (DAKHLA–FARAFRA) (section 6.9.3): al-Qasr (Dakhla) → Bir Dikkar (not depicted) → al-Qasr (Farafra) (not depicted)

DAKHLA–FARAFRA ROAD (VIA BIR ABU MINQAR) (section 6.9.3): al-Qasr (Dakhla) → Bir Abu Minqar (not depicted) → al-Qasr (Farafra)

ABU BALLAS TRAIL (section 6.10.4): Balat → Meri 99/55 site → Abu Ballas (not depicted) → Gilf Kebir (not depicted) → Gebel Uweinat (not depicted) → Libya? | Chad?

such stations are found under and over Naqb Tineida; one is located near Ain Amur and another one close to Hibis.⁴³⁵ Similarly to Darb al-Ghubbari, the run of Darb Ain Amur is strewn with lighter pottery scatters, shards dated from pre-Dynastic to Roman to Arabic periods; likewise, the trail once used to have *alamat* and windrows, but these features of the road infrastructure have since been obliterated because of extensive phosphate mining activities on the Abu Tartur Plateau.⁴³⁶

The trail eventually arrives at Ain Amur, a resting station consisting of a well, a Late Period/Graeco-Roman stone temple, a large necropolis, and remains of formerly cultivated fields.⁴³⁷ At Ain Amur, the track bifurcates. One arm descends from the plateau and strikes southeast towards Kharga (*Hibis*); another branch continues east towards Late Roman fortified sites of Ain Umm Dabadib (40 kilometres from Ain Amur) and Ain Labakha (24 kilometres from Ain Umm Dabadib – or 15 kilometres as the crow flies).⁴³⁸ The Ain Umm Dabadib complex comprised two temples (a Christian church and an Egyptian-style shrine), a large fortified settlement, a spring, several cemeteries, and a chain of satellite farming settlements to the north; fields at the site were irrigated with an extensive system of underground watering shafts and canals known as *qanat*, which bored their way into the water-bearing slope rising towards the Khargan escarpment in the north.⁴³⁹ A smaller Roman settlement of Ain Labakha encompassed a large Late Roman fort, a hilltop temple, a small living quarter, a cemetery, and several fields also watered with a *qanat* system; with its twin at Ain Umm Dabadib, the Ain Labakha fort oversaw the traffic on the easternmost section

of Darb Ain Amur.⁴⁴⁰ The road continues east from Ain Labakha about 30 kilometres and then terminates near Gebel al-Jabisa, a rocky outcrop in the vicinity of Darb Ain Amur, which merges with the Asyut/Kharga road (section 6.5.3); as such, this branch provided those travelling from Dakhla with an opportunity to bypass Kharga (Hibis) and proceed directly to the Nile Valley.⁴⁴¹ More demanding than Darb al-Ghubbari, the rougher and steeper Darb Ain Amur is unsuitable for heavily-loaded camels; thus, it is usually travelled only by those riding on donkeys.⁴⁴²

Notwithstanding pottery dumps on the Abu Tartur Plateau, North Kharga Oasis surveys led by Corinna Rossi and Salima Ikram discovered several other tell-tale signs of Graeco-Roman traffic on Darb Ain Amur between Ain Umm Dabadib and Ain Labakha.⁴⁴³ At a narrow wadi, known simply as the site C, Rossi and Ikram found two Greek inscriptions, one weathered beyond recognition, another one a good luck wish left by Anoubion, the son of (?) Mauros.⁴⁴⁴ Surveyors noted the scribble resembles other Greek 'good luck' inscriptions found around Kharga; as such, it has been tentatively dated to the 4th century CE.⁴⁴⁵ In a similar vein, Rossi and Ikram inspected the so-called site D, where on a large rock they recorded images of feet and sandals (*plantae pedis*), possibly left by Graeco-Roman travellers willing to mark their presence at this spot;⁴⁴⁶ future surveys of the stretch between Ain Amur and Ain Umm Dabadib should uncover further traces of Roman-era traffic along this road.

Recent NKOS surveys have suggested yet another trail might have linked Kharga to Dakhla; nonetheless, its existence has not been conclusively proven. Near the North Khargan site of Ain Gib, Rossi and Ikram noticed a line of four well-visible cairns that mark a hitherto unknown trail; the track branches from the main Kharga–Asyut road and veers northwest, towards one of the openings in the Khargan escarpment.⁴⁴⁷ After several kilometres, the trail turns almost directly west and navigates treacherous sand dunes that constitute the southernmost tip of the Abu Muhariq dune chain; Rossi and Ikram followed the trail for several kilometres before losing their way in the shifting sands. Having pored over the satellite maps of the area, NKOS surveyors observed the unknown trail appears to be an extension of a trail discovered by Eichhorn and later plotted by Bubenzer and Bolten.⁴⁴⁸ A branch of Darb al-Tawil, this side track diverges from the main road not far from Balat pass and strikes north-east-north, entering the so-called Great Depression, where it disappears not far from the place where Rossi and Ikram lost the Khargan path. No animal bones or pottery have been found along this sand-choked passageway. Probably, they have been all but swallowed by wandering dunes.⁴⁴⁹

6.10. Roads from major oases to sites beyond Egypt

The last, most heterogeneous group of trails comprises poorly-attested connections between oases and sites beyond Egypt. Here, I discuss largely uncharted roads that linked Siwa, Farafra, Dakhla, and Kharga with Libya and Sudan. One trail linked Siwa to Jaghbub Oasis in Libya and Farafra to unspecified oases in Libya; similarly, Darb

al-Arbain road joined Kharga to Sudan. Whether Romans knew of and travelled these trails remains largely unknown.

6.10.1. Siwa Oasis–Jaghbub Oasis road (Map 13)

Situated at the border of Egypt, Siwa always gravitated towards Libya, with the oasis being fully integrated into the Roman dominion sometime between 31 BCE and the latter half of the 1st century CE.⁴⁵⁰ Unsurprisingly, a web of desert trails connects Siwa to Libyan sites. One such track leads to Jaghbub Oasis (125 kilometres to the northwest) – and via Jaghbub to Cyrenaica and Pentapolis area.⁴⁵¹ Leaving Siwa, the track first passes through villages of Ain Rahma, Tinkamamu, Hag Ali, and Bahi al-Din, where recent surveys uncovered foundations of Graeco-Roman structures and many rock-cut tombs.⁴⁵² At Bahi al-Din, the track leaves the cultivated land and diverges. One arm strikes west towards Shayata oasis (50–60 kilometres west from Siwa), comprising a briny lake, several palm copses, some grazing land, undated rock-cut tombs, and foundations of an unidentified building thought to be Roman in origin;⁴⁵³ another arm veers northwest towards Girba oasis (50 kilometres from Siwa), where surveys have also discovered rock-hewn tombs and ancient remains.⁴⁵⁴ Both trails proceed westwards for about 50 kilometres and reunite before entering Jaghbub. The volume of Roman traffic along this trail remains unknown.

6.10.2. Farafra Oasis–Libya road (Map 15)

Several authorities on Egyptian desert roads claim there was an ancient (or even specifically Roman) road that linked Farafra to Libya via Ain al-Dalla spring;⁴⁵⁵ nonetheless, it is difficult to imagine how such a road could be travelled, as it would have to strike across the Great Sand of Sea that stretches west of Ain al-Dalla for several hundred kilometres. Unless further traces of this trail are found, its alleged run cannot be confirmed.

6.10.3. Darb al-Arbain (Forty Days Road): Kharga Oasis–al-Shabb–Selima Oasis–(?) (Map 18)

Darb al-Arbain, the famed 1770-kilometre-long Road of Forty, started in Asyut and went through the oases of Bir Kiseiba, al-Shabb, Selima, Laqiya Arba'in, al-Atrun, and Rahib, to end its run somewhere in Darfur; from the medieval period onwards, it was one of the main conduits through which ivory, gold, luxury goods, and slaves entered Egypt from the south.⁴⁵⁶ Notwithstanding its importance in the post-Roman period, it remains unknown whether its entire length was travelled in the Roman period; despite many authors affirming it had been so, no firm evidence has surfaced.⁴⁵⁷ If Darb al-Arbain saw any traffic in the Roman period, surveys at Bir Kiseiba, al-Shabb, and Selima should have uncovered quantities of Roman material. Recent discoveries at Selima appear to suggest Pharaonic- and Roman-era desert travellers occasionally visited that oasis,⁴⁵⁸ but no traces of Roman-era traffic have been detected south of it. In the light of these findings, Darb al-Arbain probably did not extend beyond Selima in the Roman period.

6.10.4. Abu Ballas Trail (Dakhla Oasis–Gilf Kebir–Gebel Uweinat–Libya or Chad?) (Maps 1, 15, 21)

One of the most exciting discoveries of desert road archaeology, the Abu Ballas trail was arguably the earliest and lengthiest long-range desert trail in ancient Egypt, linking Dakhla Oasis to remote desert sites in southwestern Egypt (such as Gilf Kebir plateau and Gebel Uweinat massif), and, possibly, to regions beyond Egypt proper (such as Lake Chad, Ennedi, Darfur, and Kerma).⁴⁵⁹ Pharaonic expeditions plying the trail probably procured exotic goods from Nubia and Chad. In 2007, desert explorers Mark Borda and Mahmoud Marai found an inscription bearing the name of Mentuhotep II (2046–1995 BCE) on the rocks of remote Gebel Uweinat massif (southwestern corner of modern Egypt). The depiction has emissaries of ‘Yam’ and ‘Tekhebet(en)’ bring respectively incense and exotic animals (oryxes?) to Mentuhotep’s representatives, who, in all probability, came to Gebel Uweinat by following the Abu Ballas trail.⁴⁶⁰ First plied ca. 2200 BCE,⁴⁶¹ the trail was furnished with extensive watering infrastructure, designed with donkeys as pack animals in mind. Pottery caches for water and fodder were placed in regular intervals throughout the length of the trail, intervals that closely correspond to distances a donkey can cover in the desert terrain without drinking.⁴⁶² The total water capacity of amassed pottery along the trail amounts to 13000 litres, with approximately 6 tons of pottery strewn along – an amount that showcases the staggering scope of this water-procuring venture.⁴⁶³

The trail was also used after the Late Old Kingdom/First Intermediate Period, but the local volume of traffic on the trail under the Romans – if any – remains open to interpretation. The pottery assemblages along the trail indicated the route saw limited traffic in the Second Intermediate Period (ca. 1800–1500 BCE) and was used again during the reign of the 18th, 19th and 20th dynasties (1400–1150 BCE), with limited evidence of later activity ranging up to the Islamic period.⁴⁶⁴ Recent surveys have also uncovered a few ribbed kegs turned on a kick wheel, with their remains tentatively dated to the Late Roman period.⁴⁶⁵ Unfortunately, obstacles such as incomplete vessel typologies, lack of discernible distribution patterns, and small reference pools impede further studies of such vessels.⁴⁶⁶ Presently, almost all of the analysed fragments of ribbed vessels suspected of being of Roman-era origin were found near Dakhla Oasis; however, one isolated assemblage was found 173 kilometres from Dakhla, at site Jaqub 00/23.⁴⁶⁷ It remains uncertain whether deposits of Roman jugs at site Jaqub 00/23 confirm the Abu Ballas trail was plied under the Romans; as an alternative point, the deposits could have simply operated as local water infrastructure, attracting multidirectional desert traffic from termini yet unknown to us. So far, no Roman-era remains have been found southeast of Jaqub 00/23. Considering all of the available evidence, I have assessed there probably was a measure of Roman-era traffic between Dakhla and Jaqub 00/23 (as marked on Map 15); however, the Roman-era use of other sections of the Abu Ballas trail – if any – will be proven or disproven only by future surveys and pottery studies.

Notes

- 1 Fakhry 1973, 11
- 2 Eichhorn *et al.* 2005, 214.
- 3 Bubenzer and Bolten 2013, 64.
- 4 El-Baz *et al.* 1980, 51–59; Czerniewicz, Lenssen-Erz and Linstädter 2004, 81–96; .
- 5 Clayton, Trafford and Borda 2008, 129–134.
- 6 Murray 1968, 153; Darnell and Darnell 2006.
- 7 Darnell and Darnell 2013b, 35–52.
- 8 Butzer and Hansen 1968, 334–350; Burmil 2003, 427–440.
- 9 Oliver and de Cosson 1938, 162–175; Graeff 2005, 17.
- 10 Oliver and de Cosson 1938, 172; Graeff 2005, 17.
- 11 Graeff 2005, 26, n.1. Roman roads usually were 4–6 metres wide; a 10-metre road gauge implies the track was laid down in another period.
- 12 Oliver and de Cosson 1938, 171–172; Graeff 2005, 18–19, 26.
- 13 Figueras 2000, 7–10; Török 2009, 182–208; Hoffmeier and Moshier 2013, 486; Snape 2013, 439–442.
- 14 Rowe 1953, 129; Habachi 1980, 13–19; Snape 2004, 149–160; Snape 2013, 439–442.
- 15 Rowe 1953, 139; Habachi 1980, 22–24; Snape 2013, 445.
- 16 Morris 2005, 641–645; Snape 2013, 444–445.
- 17 De Cosson 1935, 83–85.
- 18 Herodotus, *Histories* 2.30.2.
- 19 De Cosson 1935, 28–35; Rowe 1953, 130–131; Gabel 1999, 468; Szymańska and Babraj 2007, 162.
- 20 Arrian, *The Anabasis of Alexander* 3.3.3; De Cosson 1935, 110; Rowe 1953, 132; Bard and Shubert 1999, 759–760.
- 21 De Cosson 1935, 36–40.
- 22 Bates 1914, 232; De Cosson 1935, 38; Rowe 1953, 132.
- 23 Ball 1942, 104–105, 114, 130–136, 140.
- 24 De Cosson 1935, 106–107.
- 25 Szymańska and Babraj 2007, 162.
- 26 De Cosson 1935, 108–109.
- 27 Dhennin and Redon 2013, 36–38.
- 28 De Cosson 1935, 109–115; Ochsenschlager 1999, 760; Boussac and El Amouri 2010, 87–90.
- 29 Strabo, *Geography* 17.1.14; De Cosson 1935, 71–72; Szymańska and Babraj 2007, 161; Ochsenschlager 1999, 760.
- 30 Ochsenschlager 1999, 760; Boussac 2009, 449–453.
- 31 De Cosson 1935, 111; Ochsenschlager 1999, 761.
- 32 Claudius Ptolemy, *Geography* 4.5.4; De Cosson 1935, 115–116; Ball 1942, 136; Rowe 1953, 129, 134.
- 33 De Cosson 1935, 117–120; Ball 1942, 136.
- 34 De Cosson 1935, 125–126; Ball 1942, 136; Habachi 1980, 19–23; Daszewski 1993; 2007.
- 35 Kitchen 1996, 293–294; 1999, 329–330.
- 36 Hassan 1999, 129–129; Herbich, von der Osten-Woldenburg and Zych 2011, 210.
- 37 Daszewski 1990; 2007; Majcherek and Zych 2011, 357–361.
- 38 Strabo, *Geography* 17.1.14; Ball 1942, 104; 136; Daszewski 2007; Majcherek and Zych 2011, 357–361.
- 39 De Cosson 1935, 123–125.
- 40 Ball 1942, 154.
- 41 De Cosson 1935, 122; Rowe 1953, 142.
- 42 De Cosson 1935, 122–124; Rowe 1953, 136.
- 43 De Cosson 1935, 123.
- 44 De Cosson 1935, 120–122; Rowe 1953, 142.
- 45 De Cosson 1935, 157.

- 46 Ball 1942, 140, 154.
- 47 Ball 1942, 136, 140.
- 48 Ball 1942, 136.
- 49 Ball 1942, 62, 136, 140, 154; Rowe 1953, 141; White 1999, 469–473; 2002, 105–120; Bailey 2002, 117–152; White and Gardner 2002, 24–25; Cohen 2006, 348–349. Diodorus claimed Paraetionium was the only safe harbour of Egypt apart from Alexandria (*Historical Library* 1.31.3).
- 50 White 1999, 469–473; 2002, 105–120; White and Gardner 2002, 24–25.
- 51 White 1999, 469.
- 52 Rowe 1953, 141. For a list of ancient literary sources and papyri mentioning Paraetionium, see Cohen 2006, 349.
- 53 Arrian, *The Anabasis of Alexander* 3.3.3.
- 54 White and White 1996, 11, n. 1.
- 55 Rowe 1953, 129; Habachi 1980, 13–19; White and White 1996, 20; Snape 2004, 149–160; Snape 2013, 439–442.
- 56 Ball 1942, 136; White and White 1996, 18–20.
- 57 Ball 1942, 136, 154; White and White 1996, 22.
- 58 Ball 1942, 30–31, 136–37, 140, 154; White and White 1996, 15–18.
- 59 Ball 1942, 138–140.
- 60 Ball 1942, 154.
- 61 Procopius, *The Buildings* 6.1.2 (Chaireou); Strabo, *Geography* 17.1.16 (Schedia); Bernand 1970, 381–406; Bergmann and Heinzelmänn 2005, 1–2.
- 62 Procopius, *The Buildings* 6.1.2; Bergmann and Heinzelmänn 2005, 1–2.
- 63 Bergmann and Heinzelmänn 2005, 1–2.
- 64 Claudius Ptolemy, *Geography* 4. 5.46; Strabo, *Geography* 17.1.22; Bernand 1970, 515–50.
- 65 Bernand 1970, 575–862.
- 66 Bernand 1970, 551–73; Gascoigne 2002, 75–76.
- 67 Ball 1942, 109, 164, 173; Rowland, Wilson *et al.* 2006, 11. For alternative identifications of Nikiou, see Dhennin 2012, 120–123.
- 68 Ball 1942, 140; Graeff 2005, 27.
- 69 Ball 1942, 155; Graeff 2005, 27.
- 70 De Cosson 1935, 130, 135–141.
- 71 De Cosson 1935, 141–145, 157.
- 72 Saleh, George and Helmi 1972; Graeff 2005, 31.
- 73 White 1920, 34–37; Vivian 2009, 69–105; Hedstrom *et al.* 2010, 217.
- 74 Graeff 2005, 31–33, 31, n. 5.
- 75 Farid 1973, 21–26; Hawwass 1979, 75–87; Abd al-Aal 1983, 73–78; Graeff 2005, 31.
- 76 Hawwass 1979, 76–78.
- 77 Hawwass 1979, 86.
- 78 Graeff 2005, 31.
- 79 Palanque 1902, 163–170; White 1920, 35; Graeff 2005, 31–32.
- 80 Goedicke 1957, 84–85; Graeff 2005, 33–34.
- 81 Fakhry 1973, 15; Giddy 1987, 18, 36; Wagner 1987, 151; Jackson 2002, 255.
- 82 Petrie 1888, 35; Goedicke 1962, 26; Basta 1968, 57–63; Graeff 2005, 47–55.
- 83 Petrie 1888, 35; Basta 1968, 57; Graeff 2005, 47.
- 84 Petrie 1888, 35; Basta 1968, 62–63; Graeff 2005, 54.
- 85 Graeff 2005, 49.
- 86 Caton-Thompson and Gardner 1934, 109; Graeff 2005, 49–54.
- 87 Altenmüller and Moussa 1981, 57–84.
- 88 Basta 1968, 59–62.

- 89 Basta 1968, 62.
- 90 Graeff 2005, 54.
- 91 Basta 1968, 60; Wagner 1987, 151.
- 92 Fakhry 1973, 15; Giddy 1987, 18, 36; Wagner 1987, 151; Jackson 2002, 255.
- 93 Petrie 1888, 34; Graeff 2005, 39.
- 94 Petrie 1888, 33–36.
- 95 Petrie 1888, 36.
- 96 Altenmüller and Moussa 1981, 57–84.
- 97 Graeff 2005, 43–45.
- 98 Basta 1968, 57.
- 99 Giddy 1987, 16, 18; Fakhry 1973, 13.
- 100 Fakhry 1973, 11.
- 101 Giddy 1987, 18.
- 102 Vetter, Rieger and Möller 2013, 455.
- 103 Vetter, Rieger and Möller 2013, 456–458.
- 104 Vetter, Rieger and Nicolay 2014, 52–53.
- 105 Strabo, *Geography* 17.1.4; Brands *et al.* 2006; Vetter 2009; Vetter, Rieger and Nicolay 2009; 2014, 50–53; Rieger and Möller 2012; Vetter, Rieger and Möller 2013, 456, 459–460.
- 106 Vetter 2009, 12–14; Vetter, Rieger and Möller 2013, 457.
- 107 Vetter, Rieger and Möller 2013, 460–470.
- 108 Vetter, Rieger and Möller 2013, 471–476.
- 109 Vetter, Rieger and Möller 2013, 476–481.
- 110 Quintus Curtius Rufus, *Histories of Alexander the Great* 4.7.6–9; Strabo, *Geography* 2.5.23, 17.1.43; Diodorus, *Historical Library* 1.30.1–2; Vetter, Rieger and Möller 2013, 461.
- 111 Vetter, Rieger and Möller 2013, 468.
- 112 Vetter, Rieger and Möller 2013, 455; 480–481.
- 113 Vetter, Rieger and Möller 2013, 476.
- 114 Harding-King 1925, 304; Fakhry 1973, 15; Giddy 1987, 18; Wagner 1987, 151; Kuhlmann 1998, 159; Jackson 2002, 255; Vetter, Rieger and Möller 2013, 461.
- 115 Strabo, *Geography* 1.3.4; Pliny the Elder, *The Natural History* 5.5.50; Kuhlmann 1998, 159.
- 116 Arrian, *The Anabasis of Alexander* 3.4.5; Fakhry 1973, 14; Giddy 1987, 17; Kuhlmann 1988, 170; 2013, 147–148; Vetter, Rieger and Möller 2013, 461.
- 117 Belgrave 1923, 179–182; Fakhry 1973, 15, 135; Giddy 1987, 17; Wagner 1987, 151; Kuhlmann 1998, 167–168, 170; Jackson 2002, 255; Aldumairy 2005, 78–82, 86; Vetter, Rieger and Möller 2013, 478.
- 118 Claudius Ptolemy, *Geography* 4.5.14; Wagner 1987, 151; Jackson 2002, 255;.
- 119 Fakhry 1973, 135.
- 120 Steindorff 1904, 46, 50; Fakhry 1973, 15, 135; Wagner 1987, 151, 212; Jackson 2002, 255–256; Aldumairy 2005, 86.
- 121 Stanley 1912, 7; Fakhry 1973, 15; Wagner 1987, 151; Aldumairy 2005, 86.
- 122 Vetter, Rieger and Möller 2013, 477, 479, tab. 3.
- 123 Kuhlmann 2013, 147–148.
- 124 Giddy 1987, 18, 27, n. 141; Kuhlmann 2013, 148.
- 125 Fakhry 1973, 15, n.1.
- 126 De Cosson 1935, 155; Aldumairy 2005, 2; Kuhlmann 2013, 148.
- 127 De Cosson 1935, 153–154.
- 128 Palanque 1902, 163–170; White 1920, 35; Farid 1973, 21–26; Hawwass 1979, 75–87; Abd al-Aal 1983, 73–78; Graeff 2005, 31–33, 31, n. 5.
- 129 Fakhry 1973, 15; Giddy 1987, 18, 36; Wagner 1987, 151; Jackson 2002, 255.
- 130 Petrie 1888, 35; Goedicke 1962, 26; Basta 1968, 57–63; Graeff 2005, 47–55.

- 131 Leclant 1950, 209, n. 4; Wagner 1987, 151; Giddy 1987, 17; Fakhry 1973, 14; Kuhlmann 1998, 159; 2013, 148; Aldumairy 2005, 2; Rieger *et al.* 2012; Vetter, Rieger and Möller 2013, 462–463, 469–470, 477–478.
- 132 Quintus Curtius Rufus, *Histories of Alexander the Great* 4.7.10–15; Arrian, *The Anabasis of Alexander* 3.3.3; Fakhry 1973, 14; Giddy 1987, 17; Wagner 1987, 151. For a complete list of ancient sources mentioning this trail, see Leclant 1950.
- 133 Stanley 1912, 3–5; Giddy 1987, 17; Aldumairy 2005, 2.
- 134 Wagner 1987, 151.
- 135 Stanley 1912, 3–4.
- 136 Rieger *et al.* 2012; Vetter, Rieger and Möller 2013.
- 137 Vetter, Rieger and Möller 2013, 478, tab. 2.
- 138 Jackson 2002, 255; Rieger, Möller *et al.* 2012.
- 139 Rieger, Möller *et al.* 2012, 151–153.
- 140 Rieger, Möller *et al.* 2012, 152.
- 141 Rieger, Möller *et al.* 2012, 169–170.
- 142 Rieger, Möller *et al.* 2012, 169–172.
- 143 Vetter, Rieger and Möller 2013, 478, tab. 2.
- 144 Giddy 1987, 17; Fakhry 1973, 14; Vetter, Rieger and Möller 2013, 478, tab. 2.
- 145 Rieger *et al.* 2012, 137, fig. 2, 170, fig. 25; Vetter, Rieger and Möller 2013, 477–478.
- 146 Rieger *et al.* 2012, 137 fig. 2, 170, fig. 25; Vetter, Rieger and Möller 2013, 473, 477–478.
- 147 Fakhry 1973, 15; Giddy 1987, 17.
- 148 Rieger *et al.* 2012, 170, fig. 25.
- 149 Giddy 1987, 17; Belgrave 1923, 43–44.
- 150 Belgrave 1923, 43–44,
- 151 Belgrave 1923, 43–44.
- 152 Vetter, Rieger and Möller 2013, 478–479.
- 153 Harding-King 1925, 304; Fakhry 1974, 26; Giddy 1987, 16; Wagner 1987, 148; Graeff 2005, 61–62.
- 154 Fakhry 1974, 26.
- 155 Fakhry 1974, 26; Graeff 2005, 62.
- 156 Giddy 1987, 16; Graeff 2005, 62.
- 157 Fakhry 1947, 2–3, 8; Schwartz 1948, 57–63; Graeff 2005, 62; Brouwers 2011, 7–16.
- 158 Fakhry 1947, 4, 8; Graeff 2005, 62.
- 159 Fakhry 1947, 7–8, 11.
- 160 Steindorff 1904, 150–155; Wagner 1987, 148.
- 161 Wagner 1987, 148; *P.Lond.* 1266; *P.Mich.* inv. 6152 = Husselman 1951, 164–165; *P.Grenf.* II.50 (grain transport from Soknopaiou Nesos to the Oasis); BGU 2308 (legumes taken from Dionysias to the Oasis); BGU 697 (alum transport, from the Oasis to Arsinoe); *P.Fay.* 68 BL I 130 (animal transport from Dionysias to the Oasis).
- 162 Wagner 1987, 149, with reservations.
- 163 Giddy 1987, 16; Graeff 2005, 61.
- 164 Giddy 1987, 26, n. 125.
- 165 Cuviller 1934, 262–264; Giddy 1987, 26, n. 126.
- 166 Fakhry 1974, 25–26.
- 167 Cuviller 1934, 260; Giddy 1987, 16.
- 168 Cuviller 1934, 257–260, 262; Giddy 1987, 26 n. 127.
- 169 Fakhry 1974, 25.
- 170 Wagner 1987, 146–150.
- 171 Graeff 2005, 61, n. 6.
- 172 Harding-King 1925, 304; Fakhry 1974, 22–24; Wagner 1987, 147–148.
- 173 Fakhry 1974, 109–110; Giddy 1987, 15–16.

- 174 Wagner 1987, 147–148; Giddy 1987, 15–16, 26, n. 121.
- 175 *P.Oxy.* 43, B, II, 27; Wagner 1987, 147.
- 176 For instance, consider administrative papyri (petitions to an *epistrategos* and customs documents) enumerated below, written in Bahariya and found in Oxyrynchus, *P.Oxy.* 12.1439 (70 CE); 42.3033 (45–47 CE), 50.3569 (282 CE), 60.4071 (241–244 CE?).
- 177 *P.Oxy.* 12.1439 (70 CE); Wagner 1987, 147–148.
- 178 Kaplony-Heckel 1994, 229–238; Thissen 2013, 391–397.
- 179 For instance, see O. dem. Köln 38, 78, 163, 219, 286 (Thissen 2013).
- 180 For taxes on Coptos road, see Koptos Tariff Inscription = *I. Portes* 67 (90 CE); Sidebotham 1986, 79–81; Adams 2007, 132–133.
- 181 Eichhorn *et al.* 2005, 219–222.
- 182 Harding-King 1925, 304; Fakhry 1974, 162; Giddy 1987, 13; Jackson 2002, 232; Graeff 2005, 65–66; Barich 2014, 4.
- 183 Giddy 1987, 13; Jackson 2002, 232; Graeff 2005, 65–66.
- 184 Riemer 2003; Graeff 2005, 65–66; Barich 2014, 4.
- 185 Harding-King 1913, 458; Vivian 2008, 88, 111–112.
- 186 Harding-King 1913, 455; 1925, 202–203, 305; Giddy 1987, 12; Riemer 2003, 89; Bubenzer and Bolten 2013, 64, 71–72; Guédon 2014, 148.
- 187 Bubenzer and Bolten 2013, 64.
- 188 Giddy 1987, 12; Bubenzer and Bolten 2013, 64.
- 189 Bubenzer and Bolten 2013, 70, fig. 7, 71, fig. 9.
- 190 Harding-King 1925, 305; Giddy 1987, 12–13, 24, n. 90.
- 191 Wagner 1987, 146, n. 5; Giddy 1987, 255; Rossi and Ikram 2002, 147.
- 192 Eichhorn *et al.* 2005, 220, fig. 96.
- 193 Harding-King 1913, 456–457; 1925, 203–215; Giddy 1987, 12.
- 194 Riemer 2003.
- 195 Eichhorn *et al.* 2005, 220–222.
- 196 Eichhorn *et al.* 2005, 220–222, 224–226.
- 197 Harding-King 1913, 455; 1925, 202–203, 305; Giddy 1987, 12, 24, n. 88, 89; Graeff 2005, 73–74, map XX; Riemer 2003, 89; Bubenzer and Bolten 2013, 71–72.
- 198 Eichhorn *et al.* 2005, 220; Bubenzer and Bolten 2013, 71, *contra* Wagner 1987, 146.
- 199 Harding-King 1913, 455; 1925, 202–203, 305; Giddy 1987, 12, 24, n. 88, 89; Graeff 2005, 73–74, map XX; Riemer 2003, 89; Bubenzer and Bolten 2013, 73, fig. 10.
- 200 Bubenzer and Bolten 2013, 73, fig. 10.
- 201 Bubenzer and Bolten 2013, 73, fig. 10.
- 202 Giddy 1987, 6, 23, n. 56; Rossi and Ikram 2013, 265, 268.
- 203 Beadnell 1909, 26; Caton-Thompson 1952, 34; Giddy 1987, 6–7.
- 204 Khoury-Wagner and Décobert 1981, 333–342; Wagner 1987, 143; Morkot 1996, 84, 86; Jackson 2002, 174; Pichler and Negro 2005, 173; Roe 2005/2006, 119–129; Ducéne 2007, 245–252.
- 205 Suffice it to say at this point that the Asyut–Kharga stretch was regularly travelled in the Roman period; a cavalry unit of *Maurii scutarii* stationed at Lycopolis (Asyut) regularly crossed the desert to go to the Khargan village of Mounesis (Chams al Din) (Wagner 1987, 143, 381–382, 386).
- 206 Ikram and Rossi 2002a; 2004, 70; Ikram 2012.
- 207 Graeff 2005, 70. The majority of papers on these North Khargan sites has been written by a North Kharga Oasis Survey (NKOS) team. See Ikram and Rossi 2002a, 2002b; 2004; Rossi and Ikram 2007; 2013; Rossi 2012.
- 208 Ikram and Rossi 2004, 74–75.
- 209 Ikram and Rossi 2004, 74–76; Rossi and Ikram 2013, 271.
- 210 Rossi and Ikram 2013, 271.

- 211 Gascou and Wagner 1979, 16–20; Wagner 1987, 168; Ikram and Rossi 2004, 70–72, 86–89; Rossi and Ikram 2013, 268–269, 279–280; Guédon 2014, 146.
- 212 Gascou and Wagner 1979, 16–20; Rossi and Ikram 2013, 269; Guédon 2014, 146.
- 213 Morkot 1996, 86; Rossi 2012, 331, 333–335.
- 214 Rossi and Ikram 2013, 276.
- 215 Rossi and Ikram 2013, 274, 276.
- 216 Ikram and Rossi 2002b, 149; Rossi and Ikram 2004, 76; 2013, 276. Regrettably, the inscription text has not been published.
- 217 Verner 1973, 21–48 (in particular 25–27, 44); Huyge 1998, 1386, n. 26; Kaper and Willems 2002, 85–86.
- 218 Kaper and Willems 2002, 85–86; Kuhlmann 2005, 278–283; Kaper 2009, 171.
- 219 Ikram and Rossi 2004, 74–76.
- 220 Rossi and Ikram 2013, 275.
- 221 Rossi and Ikram 2013, 268.
- 222 Giddy 1987, 7, 23, n. 58, 59; Graeff 2005, 70–71.
- 223 Rossi and Ikram 2013, 273, fig. 5, 275.
- 224 Giddy 1987, 7, 23, n. 60; Graeff 2005, 71.
- 225 Caton-Thompson 1952, 162–164; Giddy 1987, 7, 23, n. 61, 62; Graeff 2005, 70–71; Rossi and Ikram 2013, 272–273.
- 226 Wagner 1987, 170; Giddy 1987, 7–8; Morkot 1996, 86–87; Tallet, Gradel and Guédon 2012; Tallet *et al.* 2012.
- 227 Beadnell 1909, 28–29; Caton-Thompson 1952, IX–X, pl. 126; Giddy 1987, 7, 23, n. 64.
- 228 Beadnell 1909, 28–29; Giddy 1987, 7; Graeff 2005, 77–78.
- 229 Spiegelberg 1914, 68; Wagner 1987, 142.
- 230 *P.Achmim* 7, BN135B2, line 36 (Collart 1931, 69); Wagner 1987, 141.
- 231 *O.Douch.* 1.13 6; Sauneron 1968, 11–17; Wagner 1987, 142, 384.
- 232 Giddy 1987, 7.
- 233 Giddy 1987, 7; Graeff 2005, 75–78, Plan X; Darnell and Darnell 2013a, 221–222.
- 234 Yoyotte 1953, 173–178; Dixon 1958, 40–55; Goedicke 1981, 1–20; O'Connor 1986, 27–50; Graeff 2005, 75–76; Clayton, Trafford and Borda 2008, 129–134; Cooper 2012, 1–22.
- 235 Dixon 1958, 44–45; Murray 1965, 72–73; Goedicke 1981, 9–11; Graeff 2005, 75–78, Plan X; Förster 2007, 8–9.
- 236 *P.Achmim* 7, BN135B2, line 36 (Collart 1931, 69); Wagner 1987, 141.
- 237 Caton-Thompson 1931; Beadnell 1909, 31; Roe 2005/2006, 128; Darnell and Darnell 2013a.
- 238 Beadnell 1909, 29; Darnell 2002a, 147–149; 2002b, 169–172; Darnell and Darnell 2002, 45; 2013a, 245–256.
- 239 Darnell and Darnell 2013a, 249–250, 252–256.
- 240 Beadnell 1909, 29; Darnell and Darnell 2013a, 249–250.
- 241 Vivian 2008, 158; Darnell and Darnell 2013a, 249–250.
- 242 Darnell and Darnell 2013a, 224–244.
- 243 Darnell and Darnell 2013a, 228.
- 244 Beadnell 1909, 31; Caton-Thompson 1931, 78; 1952, 107–112, 194; Caton-Thompson and Gardner 1932, 372.
- 245 Beadnell 1909, 31; Morkot 1996, 86–87; Roe 2005/2006, 128; Graeff 2006, 76–77.
- 246 Caton-Thompson 1931, 78; 1952, 107–112, 194; Caton-Thompson and Gardner 1932, 372, map 1; Giddy 1987, 7, 23, n. 64; Roe 2005/2006, 128; Graeff 2006, 76–77, map X.
- 247 Darnell's misidentification adds to the already confusing road nomenclature in the region; on his map, the road he christened 'Girga Road' clearly leads to Farshut and is to be identified with Darb al-Refuf (Darnell and Darnell 2013a, 222, fig. 1).
- 248 Darnell and Darnell 2013a, 228, 249–250.

- 249 Beadnell 1909, 29–30; Giddy 1987, 7, 23, n. 65, 66; Morkot 1996, 86–87.
- 250 Beadnell 1909, 29–32; Giddy 1987, 7, 23, n. 65, 66; Graeff 2005, 76–77.
- 251 Graeff 2005, 76–77.
- 252 Beadnell 1909, 29–32; Giddy 1987, 7, 23, n. 65, 66; Graeff 2005, 76–77.
- 253 SB 4 7403, line 30; Wagner 1987, 142, n. 2.
- 254 Strabo, *Geography* 17.1.42; Wagner 1987, 143; Guédon 2014, 149.
- 255 Beadnell 1909, 31; Caton-Thompson 1931, 78; 1952, 107–112, 194; Caton-Thompson and Gardner 1932, 372; Graeff 2005, 76–77.
- 256 Giddy 1987, 8, 23, n. 66.
- 257 Graeff 2005, 107; Caton-Thompson 1952, 40, 115–116.
- 258 Giddy 1987, 8.
- 259 Beadnell 1909, 32; Giddy 1987, 8, 23, n. 67.
- 260 Beadnell 1909, 33; Giddy 1987, 8–9, 23, n. 74, 24, n. 75; Wagner 1987, 143, n. 6–7; Morkot 1996, 84; Jackson 2002, 172; Graeff 2005, 103–107.
- 261 Giddy 1987, 8; Jackson 2002, 172; Graeff 2005, 106; Rossi and Ikram 2013, 279.
- 262 Beadnell 1909, 13; Sauneron *et al.* 1978; Gascou and Wagner 1979, 2–5; Jackson 2002, 167–169.
- 263 Wagner 1987, 176–79.
- 264 Gascou and Wagner 1979, 5–7; Giddy 1987, 8, 23, n. 74; Wagner 1987, 141, n. 5, 183–184.
- 265 Giddy 1987, 8–9; Jackson 2002, 172.
- 266 Giddy 1987, 8–9, 24, n. 75; Jackson 2002, 172.
- 267 Jackson 2002, 173.
- 268 Morkot 1996, 84; Graeff 2005, 106.
- 269 Graeff 2005, 105.
- 270 Sidebotham, Zitterkopf and Riley 1991, 597–598; Graeff 2005, 105.
- 271 Graeff 2005, 105.
- 272 Wagner 1987, 143, n. 6–7, 386.
- 273 Darnell and Darnell 1998, 90; 1995, 50–52; Darnell 2002a, 150; Graeff 2005, 97–98.
- 274 Graeff 2005, 87.
- 275 Graeff 2005, 82.
- 276 Darnell and Darnell 1997, 256–257; 2002, 6.
- 277 Darnell and Darnell 1998, 82–83; Darnell 2002a, 139; Graeff 2005, 85.
- 278 Darnell and Darnell 1995, 45–47; 2002, 89–90; Graeff 2005, 84–85.
- 279 Darnell and Darnell 1998, 81; 2002, 91.
- 280 Darnell and Darnell 1998, 91.
- 281 Darnell and Darnell 1995, 44–45; 1998, 77–78.
- 282 Darnell 2002a, 132–135.
- 283 Darnell 2002a, 132–135.
- 284 Graeff 2005, 82–83.
- 285 Darnell 2002a, 132–135; Graeff 2005, 81–82.
- 286 Darnell 2002a, 138; Köpp 2013, 116.
- 287 Darnell 2002a, 135
- 288 *P.Panop. Beatty* 2.V lines 116, 126, 134; Skeat 1964, XX, XXIII, XLIV; Darnell 2002a, 135.
- 289 Graeff 2005, 87.
- 290 Darnell 1998, 83–84; 2002a, 143; Graeff 2005, 88.
- 291 Darnell and Darnell 2002, 5–6.
- 292 Darnell and Darnell 1995, 47–50; 1997, 241–251; 2002, 35; Darnell 2002a, 143.
- 293 Darnell and Darnell 1995, 47–50; 2002, 9–10.
- 294 Darnell and Darnell 2002, 6, 18–19.
- 295 Darnell and Darnell 1995, 47; Darnell 2002a, 139–140.

- 296 Darnell 2002a, 139; Darnell and Darnell 2002, 5–6.
- 297 Darnell and Darnell 2002, 5–6.
- 298 Darnell and Darnell 1995, 50–52; 1998, 90; Darnell 2002a, 150; Graeff 2005, 97–98.
- 299 Darnell and Darnell 1997, 257.
- 300 Darnell and Darnell 1995, 48.
- 301 Darnell and Darnell 1995, 51; Di Cerbo and Jasnow 1996, 32–38.
- 302 Graeff 2005, 97.
- 303 Darnell and Darnell 1995, 50–51; Darnell 2002b, 156; Graeff 2005, 97–98.
- 304 Darnell and Darnell 1995, 50–51.
- 305 Darnell and Darnell 1995, 52; 1998, 90.
- 306 Graeff 2005, 95.
- 307 Graeff 2005, 95.
- 308 Ball 1902, 18–22; Yoyotte 1953, 174; Goedicke 1981, 3–4; O'Connor 1986, 27–50; Darnell 2003, 74–75; Graeff 2005, 115–116; Roe 2005/2006, 124; Cooper 2012, 6, 12–15; Storemyr *et al.* 2013, 399, 413, 418.
- 309 Graeff 2005, 115; Storemyr *et al.* 2013, 402–403.
- 310 Storemyr *et al.* 2013, 399–401.
- 311 Maxfield and Peacock 2001; Storemyr *et al.* 2013, 402–404.
- 312 Maxfield and Peacock 2001, 196; Sidebotham, Hense and Nouwens 2008, 45; Storemyr *et al.* 2013, 404–407.
- 313 Storemyr *et al.* 2013, 408–411.
- 314 Storemyr *et al.* 2013, 407, 412–413.
- 315 Fournet 1996, 151–152.
- 316 Jaritz 1981; Graeff 2005, 115–116.
- 317 Storemyr *et al.* 2013, 415–418.
- 318 Ball 1902, 18–22; Storemyr *et al.* 2013, 412.
- 319 Storemyr *et al.* 2013, 414–415.
- 320 Engelbach 1938, pl. LV, fig. 3, 389; Murray 1939, 111; 1968, 148; Darnell 2003, 74.
- 321 Graeff 2005, 116; Storemyr *et al.* 2013, 413.
- 322 Darnell 2003, 74, n. 8; Storemyr *et al.* 2013, 413.
- 323 Darnell 2003, 75 n. 9; Graeff 2005, 47–55; Storemyr *et al.* 2013, 413.
- 324 Darnell 2003, 81–87; 2004, 29; Darnell and Darnell 2006; Storemyr *et al.* 2013, 413.
- 325 Butzer and Hansen 1968, 334–350.
- 326 Reed 1964; Murray 1968, 153; Butzer and Hansen 1968, 334–350, 389–394; Hester and Hobler 1969; Darnell 2002b, 166–168, 173–174; Darnell 2003, 73–91; 2004, 25–32; Darnell and Darnell 2013b, 35–52; Storemyr *et al.* 2013, 413.
- 327 Darnell 2002a, 149–150; 2004, 29, n. 28; Darnell and Darnell 2006; Darnell and Darnell 2013b, 35–52; Storemyr *et al.* 2013, 401, fig. 2.
- 328 Darnell and Darnell 2006.
- 329 Graeff 2005, 116; Darnell and Darnell 2006, 2004, 29.
- 330 Murray 1939, 101; Murray 1968, 154; Hester and Hobler 1969; Darnell 2004, 28, n. 20.
- 331 Murray 1939, 101–103; 1968, 152.
- 332 Murray 1939, 103; Morkot 1996, 92.
- 333 Darnell and Darnell 2006.
- 334 Darnell and Darnell 2006.
- 335 Darnell 2003, 74–75; Storemyr *et al.* 2013, 413, 418.
- 336 Murray 1939, 100–102; Darnell 2004, 26–27, n. 11–12; Darnell and Darnell 2006, fig. 2; Storemyr *et al.* 2013, 400.
- 337 Murray 1939, 100–102; Darnell and Darnell 2006, fig. 2.

- 338 Murray 1968, 153; Darnell and Darnell 2006.
- 339 Murray 1939, 100–101; Darnell and Darnell 2013b, 35–52.
- 340 Murray 1939, 100–101; Darnell and Darnell 2013b, 35–52.
- 341 Murray 1939, 100–101; Darnell 2004, 28, n. 20; Darnell and Darnell 2006.
- 342 Darnell and Darnell 2006.
- 343 Darnell 2004, 27, 29; Darnell and Darnell 2006; compare Morkot 1996, 92.
- 344 Darnell and Darnell 2006.
- 345 Engelbach 1938, pl. LV, fig. 3, 389; Murray 1939, 111; 1968, 148; Darnell 2003, 74; Storemyr *et al.* 2013, 414–415.
- 346 Storemyr *et al.* 2013, 401, fig. 2.
- 347 Storemyr *et al.* 2013, 401, fig. 2.
- 348 Darnell 2004, 29.
- 349 Morkot 1996, 92; Darnell 2004, 29.
- 350 Morkot 1996, 85, fig. 1, 88, fig. 3, 91, fig. 4, 92; Graeff 2005, 116, 121–122.
- 351 Darnell 2002a, 149–150; Graeff 2005, 116, 121–122; Darnell and Darnell 2013b, 35–52.
- 352 Osing 1982, 39–40, tf. 9; Darnell 2002b, 166; Darnell 2002a, 149–150; Cooper 2012, 10, n. 67; Darnell and Darnell 2013b, 35–52.
- 353 Murray 1939, 101; Murray 1968, 154; Hester and Hobler 1969; Darnell 2004, 28, n. 20.
- 354 Caminos 1968, 92–93, pl. 42, graf. 6; Darnell 2004, 29, n. 28.
- 355 Hester, Hobler and Russell 1970, 385–389.
- 356 Storemyr *et al.* 2013, 408–411.
- 357 Storemyr *et al.* 2013, 407, fig. 11, 408–410. Unusually, this Roman road is wider than the standard gauge (4–6 metres) (Graeff 2005, 26, n. 1.); a 10-metre road gauge implies the track was laid down in another period.
- 358 Storemyr *et al.* 2013, 408.
- 359 Storemyr *et al.* 2013, 407 fig. 11, 408–410.
- 360 Storemyr *et al.* 2013, 410; *cf.* Mulvin and Sidebotham 2004, 611–613.
- 361 Storemyr *et al.* 2013, 410.
- 362 Storemyr *et al.* 2013, 410.
- 363 Hester, Hobler and Russell 1970, 385.
- 364 Hester, Hobler and Russell 1970, 388.
- 365 Hester, Hobler and Russell 1970, 386; Sidebotham 2011, 136–140.
- 366 Hester, Hobler and Russell 1970, 387.
- 367 Cohen 2006, 308–309; see also section 6.2.3 for Ptolemaic milestones along the Memphis–Fayum road.
- 368 Hester, Hobler and Russell 1970, 387.
- 369 Storemyr *et al.* 2013, 408–409.
- 370 Storemyr *et al.* 2013, 410.
- 371 Ball 1942, 157; Hester, Hobler and Russell 1970, 388.
- 372 Ball 1942, 145; Hester, Hobler and Russell 1970, 388–389.
- 373 De Cosson 1937, 226–227; Jackson 2002, 256–260.
- 374 De Cosson 1937, 226–229; Fakhry 1973, 135.
- 375 Jennings-Bramly 1897, 607.
- 376 Azadian 1930, II, 428–430; Giddy 1987, 18.
- 377 Rohlfs 1875, 194–195; Steindorff 1904, 135–137; De Cosson 1937, 226–229; Fakhry 1973, 136–137; Giddy 1987, 18; Wagner 1987, 212; Jackson 2002, 256–260.
- 378 Giddy 1987, 18.
- 379 Rohlfs 1875, 194–195; Jennings-Bramly 1897, 607; Steindorff 1904, 135–137; De Cosson 1937, 227–228; Fakhry 1939, 609–619; 1973, 138–142; Kuhlmann 1988, 88–90.

- 380 Kuhlmann 1988, 88–90.
- 381 Fakhry 1939, 609–619; 1973, 140–142.
- 382 Rohlf s 1875, 194–195.
- 383 Steindorff 1904, 135–137; Fakhry 1973, 140.
- 384 Riad and Schwartz 1968; Wagner 1987, 149.
- 385 De Cosson 1937, 226.
- 386 Azadian 1930, II 428–430; Giddy 1987, 18.
- 387 Fakhry 1973, 137.
- 388 De Cosson 1937, 226.
- 389 Aldumairy 2005, 83–85; Gallo 2006a; 2006b.
- 390 De Cosson 1937, 227; Fakhry 1973, 137; Jackson 2002, 260; Aldumairy 2005, 85–86.
- 391 Aldumairy 2005, 85–86.
- 392 Jennings-Bramly 1897, 607; Belgrave 1923, 184; Harding-King 1925, 304; De Cosson 1937, 226; Fakhry 1973, 15; 1974, 26–28; Giddy 1987, 18; Wagner 1987, 149, 153; Kuhlmann 1998, 159–160.
- 393 Fakhry 1973, 15; Jackson 2002, 239; Aldumairy 2005, 78–81; Kuhlmann 2013, 147–148.
- 394 Belgrave 1923, 184; De Cosson 1937, 227; Fakhry 1974, 26; Giddy 1987, 18; Wagner 1987, 149.
- 395 Jackson 2002, 239.
- 396 Fakhry 1974, 26–27.
- 397 Leclant 1965, 178–179; Wagner 1987, 149.
- 398 Aldumairy 2005, 82.
- 399 Leclant 1965, 178–179.
- 400 Wagner 1987, 149.
- 401 Fakhry 1973, 15; 1974, 26.
- 402 Belgrave 1923, 184; De Cosson 1937, 226–227; Giddy 1987, 18; Jackson 2002, 257.
- 403 De Cosson 1937, 226.
- 404 Rohlf s 1875, 188–204; Belgrave 1923, 184; Graeff 2005, 76–77.
- 405 Belgrave 1923, 184.
- 406 Fakhry 1974, 162; Giddy 1987, 14.
- 407 Jennings-Bramly 1902, 74; Harding-King 1925, 302; Fakhry 1974, 162, 165; Giddy 1987, 14; Wagner 1987, 150, 365.
- 408 Jennings-Bramly 1902, 74.
- 409 Fakhry 1974, 165; Wagner 1987, 365.
- 410 Giddy 1987, 14, 48.
- 411 Giddy 1987, 14, 25, n. 103–106; Wagner 1987, 150; Graeff 2005, 63.
- 412 Fakhry 1974, 26, 110–124; Jackson 2002, 237; Dospěl and Suková 2013, 6–7.
- 413 Fakhry 1974, 26, 110–124; Jackson 2002, 237; Dospěl and Suková 2013, 6–7, 9.
- 414 Dospěl and Suková 2013, 8.
- 415 Fakhry 1974, 26; Giddy 1987, 14, 25, n. 103–106; Wagner 1987, 150; Graeff 2005, 63; Finocchi and Medaglia 2011, 102–103.
- 416 Fakhry 1974, 26; Giddy 1987, 14, 25, n. 103–106; Wagner 1987, 150; Jackson 2002, 231; Graeff 2005, 63; Finocchi and Medaglia 2011, 94, 102–103, 105.
- 417 Finocchi and Medaglia 2011, 94, 102–103; Salvatore Medaglia, personal communication.
- 418 Giddy 1987, 14, 25, n. 103–106; Wagner 1987, 150; Jackson 2002, 231.
- 419 Fakhry 1974, 162; Giddy 1987, 13–14, 25 n. 101–102; Wagner 1987, 150; Jackson 2002, 226–227; Graeff 2005, 65.
- 420 Fakhry 1974, 162; Jackson 2002, 226–227; Graeff 2005, 65.
- 421 Jackson 2002, 226–227.
- 422 Fakhry 1974, 162; Giddy 1987, 13–14, 25 n. 101–102; Wagner 1987, 150; Jackson 2002, 226–227; Graeff 2005, 65.

- 423 Harding-King 1925, 304; Fakhry 1974, 162; Giddy 1987, 13–14, 25, n. 101–102; Wagner 1987, 150; Graeff 2005, 65.
- 424 Harding-King 1913, 459–460.
- 425 Harding-King 1913, 460; Fakhry 1940b, 871; 1974, 162; Giddy 1987, 13–14, 25, n. 101–102; Graeff 2005, 65.
- 426 Harding-King 1925, 305; Winlock 1936, 7–15; Giddy 1987, 10–11; Jackson 2002, 197–199; Graeff 2005, 109; Rossi and Ikram 2013, 276.
- 427 Winlock 1936, 7–15; Giddy 1987, 10–11, 24, n. 83; Graeff 2005, 109.
- 428 Wagner 1987, 144; Jackson 2002, 197–199; Graeff 2005, 109.
- 429 Jackson 2002, 197–199; Graeff 2005, 109.
- 430 Giddy 1987, 10–11; Jackson 2002, 197–199; Graeff 2005, 109; Rossi and Ikram 2013, 276.
- 431 Harding-King 1925, 305; Giddy 1987, 10–11, 24, n. 81.
- 432 Giddy 1987, 10–11; Graeff 2005, 109.
- 433 Jackson 2002, 197–199. In addition, Wagner (1987, 144) mentions a Roman papyrus that describes a four-day and four-night waterless road between Kharga and Dakhla, in Wagner's view to be identified as Darb al-Ghubbari.
- 434 Giddy 1987, 11; Wagner 1987, 145; Jackson 2002, 199–200; Rossi and Ikram 2002, 145–150; 2013, 276–277; Graeff 2005, 109–111; Roe 2005/2006, 128; Ikram 2012, 9–18.
- 435 Winlock 1936, 48–50; Giddy 1987, 11, 24, n. 85; Jackson 2002, 199–200; Graeff 2005, 109–111.
- 436 Winlock 1936, 44–52; Giddy 1987, 11, 24 n. 84; Wagner 1987, 145; Jackson 2002, 199–200; Graeff 2005, 109–111; Roe 2005/2006, 128.
- 437 Gardner 1935, 108–110; Winlock 1936, 48–50; Fakhry 1940a, 761–768; Giddy 1987, 11, 24, n. 84; Wagner 1987, 145; Jackson 2002, 195–197; Graeff 2005, 109–111; Roe 2005/2006, 128; Rossi and Ikram 2010, 235–242.
- 438 Giddy 1987, 11, 24, n. 87; Graeff 2005, 109–111.
- 439 Giddy 1987, 11, 24 n. 87; Wagner 1987, 145; Rossi 2000, 235–252; Jackson 2002, 190–195; Graeff 2005, 109–111; Rossi and Ikram 2006, 279–306; Rossi 2012, 331–336.
- 440 Giddy 1987, 11; Wagner 1987, 145; Jackson 2002, 187–189, 199–200; Rossi and Ikram 2002, 144–145; 2010, 235–242; Graeff 2005, 110–111; Rossi 2012, 331–336.
- 441 Rossi and Ikram 2002, 142–151; Graeff 2005, 110–111.
- 442 Giddy 1987, 11; Graeff 2005, 110.
- 443 Rossi and Ikram 2002, 145–150.
- 444 Rossi and Ikram 2002, 148, Tafel XXIII a.
- 445 Rossi and Ikram 2002, 148. For other examples of such inscriptions, see Wagner 1987, 33 no. 34, 34 no. 37, 36 no. 45, 48, 41 no. 61, 54 no. 7, 59 no. 1.
- 446 Rossi and Ikram 2002, 149, Tafel XXVII a/b. It is unknown whether *plantae pedis* have been left only by Graeco-Roman travelers; see section 6.5.3 for a discussion of these signature carvings.
- 447 Rossi and Ikram 2013, 278.
- 448 Eichhorn *et al.* 2005, 215, fig. 1; Bubenzer and Bolten 2013, 73, fig. 10; Rossi and Ikram 2013, 278.
- 449 Rossi and Ikram 2013, 278.
- 450 Kuhlmann 1998, 164; Jackson 2002, 241.
- 451 Fakhry 1973, 15; Jackson 2002, 256; Kuhlmann 2013, 146–147.
- 452 Aldumairy 2005, 72–73.
- 453 Aldumairy 2005, 73.
- 454 Aldumairy 2005, 73.
- 455 Jennings-Bramly 1902, 73–74; Bates 1914, 11; Harding-King 1925, 304; Fakhry 1940b, 856, fig. 90, 871; 1974, 158; Giddy 1987, 14, 26, n. 110; Jackson 2002, 231–232.

- 456 Khoury-Wagner and Décobert 1981, 333–342; Morkot 1996, 90–92; Rossi 2000, 337; Pichler and
Negro 2005, 173; Roe 2005/2006, 120–121; Ducéne 2007, 245–252; Kuhlmann 2013, 133.
- 457 See Roe (2005/2006) for an excellent synopsis of the discussion so far.
- 458 Pichler and Negro 2005, 174.
- 459 Förster 2007, 1–36; 2013, 309–314.
- 460 Clayton, Trafford and Borda 2008, 129–134; Förster 2013, 314–321.
- 461 Förster *et al.* 2010, 54.
- 462 Förster *et al.* 2010, 59–60.
- 463 Förster *et al.* 2010, 59–60.
- 464 Förster *et al.* 2010, 62.
- 465 Hendrickx, Förster and Eyckerman 2013, 360–361.
- 466 Hendrickx, Förster and Eyckerman 2013, 360–361.
- 467 Hendrickx, Förster and Eyckerman 2013, 360–361, 362, fig. 28

Road density area studies

7.1. Introduction

In the following sections, I discuss four basic types of trail networks in the Egyptian deserts and compare and contrast two dissimilar areas of the desert that saw developments in road infrastructure under the Romans, namely Marmarica and the central/southern portion of the Eastern Desert. In contrast to dominant research paradigms, my discussion of desert road network types distinguishes between two types of termini a desert trail can have, that is, terminal points and terminal zones. A two-dimensional attractant structure, a zone increases regional connectedness more than a single-dimension point, with the settlements within encouraging the development of multiple feeder trails instead of one hub trail. Both Marmarica and the Eastern Desert represent the point-zone network type, but this evolutionary convergence stems from different logistic strategies. Expensive wares coming from all over the Eastern Desert had to be funnelled into narrow corridors to secure their transit, whereas high-bulk/low-price commodities circulating between Siwa and the Mediterranean coastal zone concentrated in the oasis due to its geographical positioning.

Before I proceed, I would like to hedge my study with certain stipulations. Employing rudimentary types of statistical analysis, I am well-aware that most – if not all – ancient economy studies employing actual numbers are skewed at best. Importantly, as some road stations are notoriously difficult to date, I choose and enumerate only those that were firmly placed in the Roman period and not earlier. Inasmuch as distinguishing between Ptolemaic and Roman occupation layers may pose difficulties, I include only those nodes that appeared in the Roman period, excluding all that show traces of the Ptolemaic or earlier occupation. I realise this conservative approach may distort my data, but I believe it is better to underemphasise the

Roman influence on investigated road networks than to succumb to the previously discussed Roman bias and wrongly classify Late, Persian, or Ptolemaic sites as new Roman foundations.

7.1.1. Basic types of desert trail networks

To enumerate and discuss types of desert trail networks in Roman Egypt, one has to examine how various roads coexist in the landscape context of Egypt. A single road is preferentially conceptualised as a simple line or as a chain of midway stations.¹ In the conservative research paradigm, a desert road or trail equals a line connecting two points in space, commencing at point A and terminating at point B. Newer research paradigms stress the nodular nature of such trails. Every desert traveller passes through several midway sites (nodes) before arriving at his or her destination, with different types of nodes attracting different types of traffic. What these two paradigms share is the notion of a road as a linear structure defined through its termini. A road is perceived as a linear landscape feature that links two terminal points and does not split or join any other track. However, a glance at the desert road map of Egypt contradicts such a notion. Isolated roads do exist in the desert context, but they are relatively rare; more commonly, roads bifurcate and come together again, forming a dense web of criss-crossing trails.

Importantly, such webs of desert trails hint that roads seen in context often appear to link, not **points**, but rather **habitable zones**, elongated swaths of land where distinctions between one node and another become fuzzy. Egypt differs from its neighbouring countries in that its oases host relatively few of the country's inhabitants; most dwell in the breadbasket known as the Nile Valley. Accordingly, the Nile Valley examined in terms of the desert road traffic differs much from a traditional desert road terminus. Conventionally, a desert road links two traffic nodes, going from an easily discernible point A to an easily discernible point B. However, the Valley is not so much a road terminus, as it is a terminal zone; for instance, roads originating in the oases tend to split as they approach the Valley, with minor branches linking riverine towns and villages to main tracks.

Egyptian road termini and terminal zones differ in structure and function. Point-contained road termini tend to be small, regularly-shaped pockets of agriculturally productive land that house a limited human population; for example, one may mention oases, such as Farafra or Bahariya. In contrast, a zone is a ribbon of land abutting a linear landscape feature, such as a sea shore, a river, or an edge of a depression, with several population centres strewn along it; importantly, such a zone may or may not be fertile. In my view, Egypt has several lands that should be reclassified as terminal zones in terms of desert traffic analysis. Among such elongated habitation zones one may enumerate the Nile Valley, the coast of the Mediterranean, the coast of the Red Sea, and the elongated hollow of Kharga Oasis. Trails linking a zone to another zone or to a point often run in a markedly different manner from those linking two point-contained termini. Differences between these types of roads are discussed in

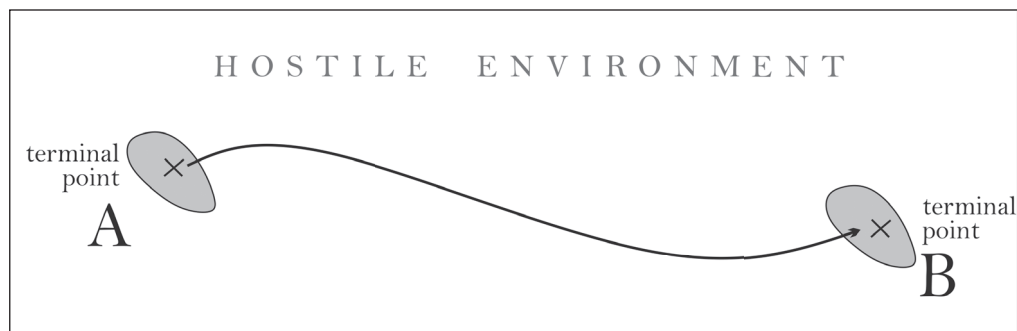


Fig. 7.1 Single-track trails (point-to-point)

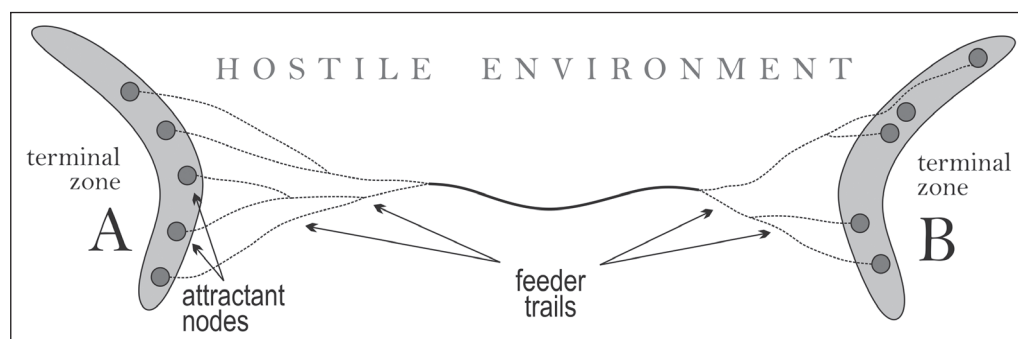


Fig. 7.2 Single-track trails with fan-shaped ends (zone-line-zone)

subsections below. Please note that all considerations below are ideal models, as most trail networks only approximate them.

7.1.2. Single-track trails (point-to-point)

Single line desert trails traversing the arid environment to connect two self-contained settlements conform to the conservative linear A-B desert road standard; notably, few Egyptian roads belong to that type. Prime examples are found in inter-oasis tracks, linking one desert agricultural centre to another. One may enumerate trails linking Bahariya to Farafra (section 6.9.2) and Siwa (section 6.9.1.1). Given the small size of an average oasis, it is obvious why their access roads do not split upon approach. Small distances between oasis villages ensure any location can be conveniently reached from the administrative centre of an oasis to which such an inter-oasis access road usually leads.

7.1.3. Single-track trails with fan-shaped ends (zone-line-zone)

Schematics of trails running between two zones are, as a rule, more complicated than those of roads linking two-point termini, as elongated shapes of two zones and the number of settlements in them usually result in several trails directly criss-crossing

the desert between them. However, minor roads originating at the population centres in one zone occasionally converge into a single trail before striking through the high desert; approaching another terminal zone, they fan out again into several branches, linking the hub road to minor communities. Road networks of this type tend to appear in a terrain that is rough, waterless, dangerous, or otherwise difficult to cross. In the interest of personal safety, travellers do not strike directly through the desert but make a detour to follow a convenient trail that has been travelled and regularly sees large numbers of other caravaneers, who can help the traveller out in case of emergency. Perhaps the most elusive type of road network systems, single trails that fan out may be thought of as simultaneously common (because many otherwise point-to-point trails have at least one minor branch somewhere near their termini) and rare (because genuine fan-line-fan road systems are quite rare due to Egypt's topography and other factors). One desert road that fans out at its termini is Darb al-Tawil road (section 6.5.2), which links Asyut to Dakhla Oasis. On its Dakhla end, the road starts as several feeder trails that converge near Naqb Shusina pass in the vicinity of Abu Gerara escarpment; from that point, the road proceeds northeast as a single track until reaching Beni Adi near Asyut, where it splits again into several feeder trails descending into the Nile Valley.

7.1.4. *Criss-crossing interzonal webs*

When two zones lie parallel to each other, and each zone has a number of settlements, travellers between two zones may favour direct crossings through the desert; as a result, the road network system becomes a winding web of trails criss-crossing the desert strip. The reasons travellers choosing to cross the desert directly instead of following single track roads with fan-shaped termini should be considered within the context of a local landscape. Factors facilitating the development of webs apparently include positioning of terminal zones and the relative desert travel difficulty in the area. If two parallel zones are separated by a relatively narrow and flat strip of the desert, it can be reasonably expected that travellers will strike the desert and directly cross from one community to another instead of taking a detour to follow a single-track road. Arguably, in such

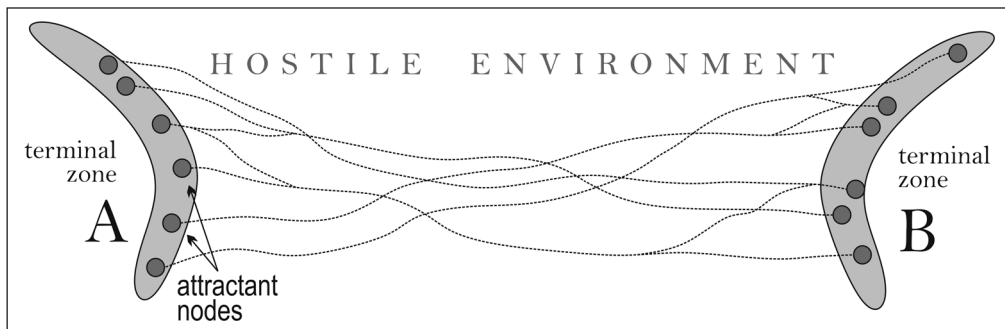


Fig. 7.3 Criss-crossing interzonal webs

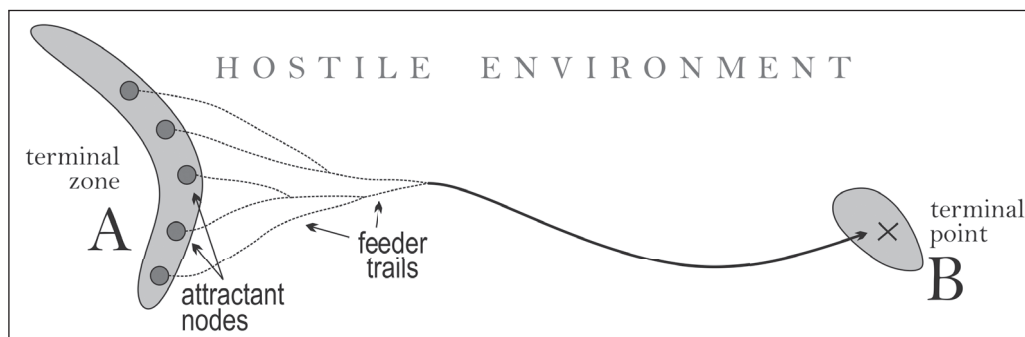


Fig. 7.4 Trails that fan out (point-zone)

a scenario, the terrain to be covered must have access to enough water to facilitate direct crossings. If it is not so, one can expect that travelling parties may attempt to furnish trails between two zones with roadside water storage installations, such as pottery mounds. An example of a webbed road network between two zones may be found in the area between Kharga Oasis and the Qena Nile Bend (section 6.6), where the elongated Khargan hollow roughly parallels the Nile Valley, with two agricultural zones separated by a strip of the desert averaging about 150 kilometres in width.

7.1.5. Trails that fan out (point-zone)

When a trail connects a terminal point to a terminal zone, a single-track road must fan out upon approach to the zone, splitting into feeder trails that link all communities in the zone to the trans-desert hub road. From a perspective of the terminal point, such feeder trails are coterminous, as all trails that spread out from the zone terminate at the same point. A good example of such a road system may be found in the Eastern Desert of Egypt, where roads leading from Roman imperial quarries at Mons Claudianus and Mons Porphyrites coterminate at Qena (Kaine). An interesting question to be pondered is what makes particular termini attractive enough to funnel all regional desert traffic towards a single terminal point, especially if one considers that such terminal points every now and then lie in terminal zones and should theoretically foster the development of fanning trails or webs rather than single-point termini.

7.2. Area studies

In the following sections of this chapter, I compile the amassed body of evidence and employ it to discuss continuity and change in the desert road networks under the Romans, the investigated areas comprising (a) the central and southern section of the Eastern Desert and (b) the central part of Marmarica Plateau. Factors to figure into my enquiry include the prevalent type of road network in the analysed area (single-track, single-track that branches out at both termini, single-track that

branches out at one terminus, interzonal web) and types of nodes appearing in the investigated period (30 BCE–late 2nd century CE), with a stipulation that one node can share several functions. Since it is impossible to objectively quantify all major and minor road stations, depots, watering holes, and quarries in the region, I chose to draw the number of sites in the region from Sidebotham's lists of sites situated on or near the main desert roads, as these sites have visible links to adjacent road systems. To recapitulate the research aims of this dissertation, I intend to examine selected regions for natural and anthropogenic factors that could have influenced the local desert traffic, with the following research questions in mind:

- a) What was the influence of terrain topography and geology on the road/node density in analysed desert areas?
- b) What was the road/node density in analysed desert areas before the advent of Romans (**continuity**)?
- c) How much did the road/node density increase in analysed desert areas under the Romans (**change**) and why?

7.2.1. Central and southern sectors of the Eastern Desert

The roads in the Eastern Desert connected ancient Egypt, *i.e.* the Nile Valley, with Wadi Gawasis, Berenike and other Red Sea ports for shipping goods overseas, mainly to and from southern Arabia and the Horn of Africa [...] Exotic incense and aromatics are among the most important commodities that had to be transported overland from the ports to the Nile Valley. This necessitated a road network that was outstanding in terms of traffic intensity and infrastructure when compared to the Western Desert roads. Here, it is not only the transport of goods, but also the maintenance of power and administration that led to regular postal traffic and policing of the roads in antiquity.²

How can the reconceptualisation of desert roads into nodular structures help us gauge the changes in road density? Let us look at one exemplary area of the Eastern Desert that underwent many changes in the Roman period, namely, the central sector of the Eastern Desert. The investigated area comprises a quadrilateral tract of the rugged, mountainous Eastern Desert, with its points at Farshut and Edfu in the Nile Valley and at the Red Sea settlements of Abu Sha'ar and Berenike. The investigated part of the desert is dominated by steep Atbai Mountains, tumbling down to the Red Sea coastal plain; in the west, the mountains fall to the rolling expanse of hillocky plateaus that eventually meet the edge of the Nile Valley.³ Due to its high elevation and specific geological make-up, the Eastern Desert stores water relatively well. Groundwater is often found at a shallow depth and can be withdrawn by digging makeshift wells in the wadi beds.⁴ Unsurprisingly, traffic in the Eastern Desert tends to follow dry beds of rivers that once flowed from the chain of peaks in the centre to the Red Sea or the Nile Valley. Ancient trails crossed the desert from west to east, navigating well-watered wadi beds where wells and waterholes could be found at intervals regular enough to ensure proper watering of beasts of burden.

In the network of trails crossing the analysed section of the Eastern Desert, one may distinguish three coterminous trail subsystems (northern, central, and southern), with their terminal points respectively situated at Qena (Kaine), Quft (Coptos), and Edfu (Apollonopolis Magna). In the northern part of the analysed area, two eastward roads radiated from Qena. The northern one, *Hodos Porphyritou*, led to Mons Porphyrites and the southern one, *Hodos Klaudiane*, to Mons Claudianus.⁵ A third track diverged from *Hodos Klaudiane* and crossed through auriferous areas north of Wadi Hammamat to the area of modern Red Sea port, Wadi Safaga; ancient authorities have claimed the Wadi Safaga region was the location of Philoteris/Aenum,⁶ a minor Red Sea port operating in the Ptolemaic/Early Roman periods, but the exact location of Philoteris has never been determined.⁷

In the central part of the analysed area, one finds Quft (Coptos), an important trading town at a convergence of two desert roads (*Hodos Mysormitike* and *Hodos Berenikes*) along which the Red Sea trade goods were transported into the Nile Valley.⁸ The road from Coptos to Myos Hormos (Quseir al-Qadim) struck roughly east, whereas the road to Berenike proceeded southeast. The volume of traffic on *Hodos Mysormitike* was directly related to the volume of cargo that came into the Myos Hormos harbour. Tellingly, Myos Hormos and the road that linked it to the Nile Valley lost much of their significance in the second half of the 1st century CE, when Red Sea merchants began to favour the harbour at Berenike and the road that led to it.⁹

In the southern part of the analysed area, one finds an eastward-directed trail that originated at Edfu (Apollonopolis Magna) and bifurcated at Abu Rahal. The northern branch continued east and ran ca. 240 kilometres to Marsa Nakari, the site where the ancient port of Nechesia is thought to have been located,¹⁰ whereas the southern branch turned southeast and ran towards Berenike, from al-Dweig onwards converging with the Coptos–Berenike road.¹¹ Two Edfu-originating trails show traces of heavy traffic during the Ptolemaic period but little or no material from the Roman period; consequently, it is probable that the southern trail subsystem lost much of its former meaning under the Romans, with the balance of trade shifting in favour of the Coptos terminus.

7.2.1.1. Qena road subsystem

Let us now analyse the road system of the investigated area, discussing three subsystems (Qena/Quft/Edfu) and their respective nodular/network structures.¹² The northern road subsystem with its terminus at Qena is linked to prospecting activities and the transport of mineral resources from quarries/mines into the Nile Valley. Mons Claudianus and Mons Porphyrites sites were of interest to the Roman government due to large marble quarries and gold mines operating in the vicinity, the right to quarry and mine these resources being an imperial monopoly. Stations adjoining these roads varied in design and size. Archaeologists have found large administrative centres with a mixed military-civilian presence at Mons Claudianus, Mons Porphyrites, and Abu Zawal; however, many diminutive fortlets have also been discovered nearby. Despite the lack of uniformity in

Table 7.1 New resource extraction nodes in the Qena subsystem

New resource extraction nodes in the Qena subsystem	Type of node	Occupied in (dated through pottery/ other remains)
1. Mons Porphyrites	Quarry	1st–4th/5th c. CE
2. Umm Sidra	Quarry	1st–4th/5th c. CE
3. Umm Balad	Quarry / military	1st–4th c. CE
4. Fatireh al-Beida	Quarry	Early Roman
5. Umm Huyut	Quarry	1st–2nd c. CE
6. Mons Claudianus	Quarry	1st–3rd/4th c. CE
7. Tiberiane	Quarry	Early/middle Roman
8. Maghrabiya	Quarry	1st–2nd c. CE

Table 7.2 New trading nodes in the Qena subsystem

New trading nodes in the Qena subsystem	Type of node	Occupied in (dated through pottery/ other remains)
1. Bab al-Mukhenig	Trade (road stop)	1st–5th/6th c. CE
2. Wadi Abu Shuwehat	Trade (road stop)	Likely 1st–3rd/4th c. CE

fortlet design, the installations and roads suggest their intended function. The ubiquity of watering lines or troughs and finds of paved road sequences indicate the Mons Claudianus/Mons Porphyrites roads were set for large numbers of animals carrying heavy loads of marble, gold, and other precious resources. By Diocletian's time, these roads were extended eastwards. Converging near the Red Sea shore, they linked quarries to the newly-built large fort at Abu Sha'ar.¹³ A mentioned side track diverged from *Hodos Klaudiane* at Abu Greiya and linked this station to Wadi Gawasis/Quei at the Red Sea shore; in contrast to *Hodos Porphyritou* and *Hodos Klaudiane*, the Wadi Gawasis track apparently experienced its heyday before the Roman period. In the Ptolemaic period, the track served as an access route to several gold mining installations operating in the region; by the Roman period, the trail lost much of its former significance, with the mines having been abandoned.¹⁴

Generally, the central part of the Eastern Desert is not an agriculturally productive area, therefore, one would first have to look at changes in the number of other types of nodes to ascertain the increases in the road density during the Roman period. In the Qena road subsystem, the developmental impetus was the emergence of **eight new quarrying nodes**, presented below:

Stone transport in the region brought about the emergence of at least **two new trade nodes**: road stops and roadside installations built to address the needs of transport caravans and travelling stonecutters. More stations have been tentatively

Table 7.3 New military nodes in the Qena subsystem

New military nodes in the Qena subsystem	Type of node	Occupied in (dated through pottery/ other remains)
1. Al-'Aras	Military/water	1st–4th c. CE
2. Al-Heita/Qasr al-Jin	Military/water	1st–2nd/late 4th–6th c. CE
3. Al-Saqqia	Military/water	1st–2nd/3rd–4th c. CE
4. Deir al-Atrash	Military/water	1st–6th c. CE
5. Qattar	Military/water	1st–4th c. CE
6. Umm Balad	Military/quarry	1st–4th c. CE
7. Badia'	Military	1st–2nd and 4th–5th c. CE
8. Wadi Belih	Military	1st–2nd c. CE
9. Abu Sha'ar al-Qibli	Military/water	2nd–5th/6th c. CE
10. Wadi Abu Greiya	Military	Likely 1st–3rd/4th c. CE

Table 7.4 New water nodes in the Qena subsystem

New water nodes in the Qena subsystem	Type of node	Occupied in (dated through pottery/ other remains)
1. Al-'Aras	Military/water	1st–4th c. CE
2. Al-Heita/Qasr al-Jin	Military/water	1st–2nd/late 4th–6th c. CE
3. Al-Saqqia	Military/water	1st–2nd/3rd–4th c. CE
4. Deir al-Atrash	Military/water	1st–6th c. CE
5. Qattar	Military/water	1st–4th c. CE
6. Abu Sha'ar al-Qibli	Military/water	2nd–5th/6th c. CE
7. Mons Claudianus	Quarry/water	1st–3rd/4th c. CE
8. Mons Porphyrites	Quarry/water	1st–4th/5th c. CE

dated to the Roman period, but until more pieces of data emerge, only four can be taken into account in this analysis.

Growing traffic in the region eventually resulted in **ten nodes with military installations** being built along the roads to protect travellers. Such installations often combine other functions. *Praesidia* also count as trade nodes used as resting stops for caravans and most often having access to a reliable water source.

Erection of new forts and roadside installations was connected to the search for new, reliable water sources. Owing to the water-storing nature of the Eastern Desert, no less than **seven new water nodes** were established during the Early Roman period. The most basic class, water nodes often overlie other kinds of nodes. Importantly, the ones enumerated below are only those surveyed and securely dated to the 1st and 2nd century. Indeed, it is probable that there were many more wells that have since

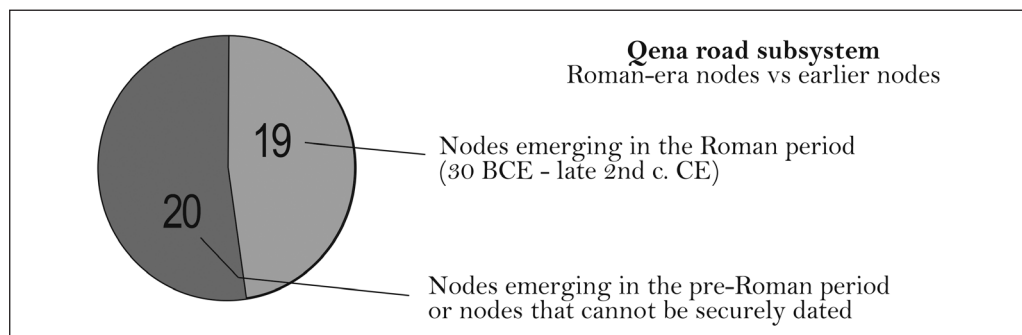


Fig. 7.5 Qena road subsystem: new nodes in the Roman period

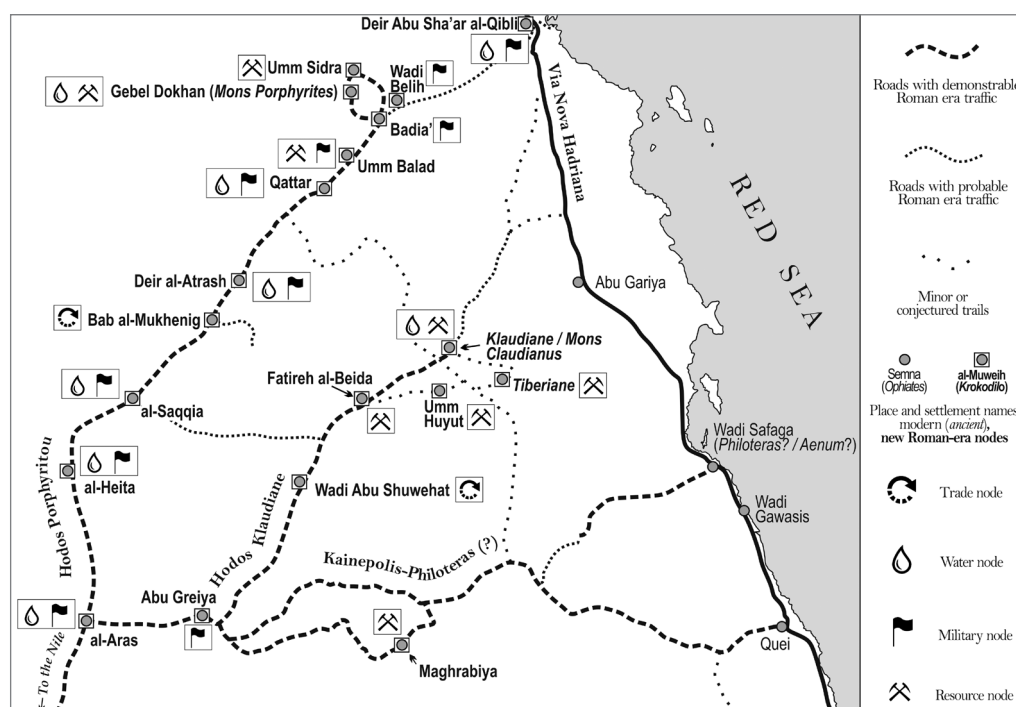


Fig. 7.6 Qena road subsystem: spatial distribution and typology of new nodes

been lost to us; for instance, we know of several stations that were furnished with animal watering lines, but surveys have not found wells used to water the tethered beasts of burden.

Out of **thirty-nine roadside nodes** enumerated by Sidebotham for the analysed desert region,¹⁵ **nineteen** appear to have been erected in the Early Roman period (30 BCE–late 2nd century CE), confirming the Qena road subsystem underwent a massive development after the Roman conquest, with functional increases in connectedness and infrastructure resulting in increased road density; evidently, the development was

sparked by Roman mineral prospecting and quarrying activities in that region. Among the nodes found within this sector there appears a functional distinction between prospecting activities and military function: save Umm Balad, no other node has both military installations and mineral resource extraction facilities. This division probably arose due to the logistics of desert travel and transport in the region: quarries were hewn on the mountain slopes, whereas forts were built in wadis, near trails and water sources, to control population movement and protect stone shipments from robbers.

7.2.1.2. Quft road subsystem

The central road subsystem with its terminus at Quft chiefly served as a trade conduit for African and Indian wares imported through the Red Sea ports of Myos Hormos and Berenike, with two main roads (*Hodos Mysormitike* and *Hodos Berenikes*) linking them to Quft. A port of call for Red Sea trade, Myos Hormos was occupied in Ptolemaic, Early Roman, and Islamic periods, directly contending with Berenike for wares and cargo.¹⁶ Strabo claimed, in his day, the bulk of cargo arrived through Myos Hormos, not through Berenike.¹⁷ Nonetheless, later sources indicate, thanks to its more southerly location, Berenike became the chief port of call for Indian merchandise; the ancient merchants returning from India preferred to disembark in Berenike rather than to sail to Myos Hormos and tack against the prevailingly northern winds for an additional 270 kilometres alongside jagged coral reefs.¹⁸ In contrast to quarry access roads radiating from Qena, *Hodos Mysormitike* (see section 5.2.4) did not pass any quarries or mines worked in the Roman period. Installations on the trail were all *praesidia*, erected to protect precious cargo travelling along it. Military installations found along the road to Myos Hormos were not simultaneously occupied. Some were manned in the Ptolemaic and Early Roman period (Qasr al-Banat, al-Hamrah), some were deserted and reoccupied in the Late Roman period (al-Matula), and some were continuously occupied throughout the entire Graeco-Roman era (Fawakhir/Persou).

At Laqeita road junction, where *Hodos Berenikes* diverged from the Myos Hormos road, the track turned sharply southeast and ran 380 kilometres before it arrived at Berenike (see section 5.2.5), the major port through which Indian goods were imported into Roman borders.¹⁹ In the Early Roman period, the Coptos-Berenike road grew in importance, putting into the shade the previously important southern track between Berenike and Apollonopolis Magna (Edfu).²⁰ The longest direct Nile Valley-Red Sea crossing and a conduit for Indian merchandise, *Hodos Berenikes* was significant enough to merit a mention in Strabo, Pliny, the *Antonine Itinerary*, and the *Peutingier Map*;²¹ no other Eastern Desert road was described in such detail and in so many literary sources. Similarly to stations along *Hodos Mysormitike*, installations along *Hodos Berenikes* were dated to slightly different periods; however, most can be securely dated to the Roman era. In the case that a node could not be easily included into Ptolemaic or Roman foundations, I erred on the side of caution and omitted it from the list.

In the Quft road subsystem, the developmental impetus was the emergence of the Indo-Roman trade, which necessitated the construction of no less than **nineteen**

Table 7.5 New nodes in the Quft subsystem

New nodes in the Quft subsystem (modern / ancient name)		Type of node	Occupied in (dated through pottery/other remains)
1. Al-Matula		Military/water	1st–2nd and 5th c. CE or later
2. Laqeita (<i>Phoenicon</i>)		Military/water	At least Early Roman (inscriptions of <i>Claudius</i> and <i>Vespasian</i>)
The road bifurcates			
To Myos Hormos	3. Al-Muweih (<i>Krokodilo</i>)	Military/water	Late 1st–2nd c. CE at least–up to 3rd c. (?)
	4. Al-Hammamat	Military/water	At least 2nd c. CE and Islamic
	5. Al-Zerqah (<i>Maximianum</i>)	Military/water	1st–2nd c. CE at least
	6. Al-Hamrah	Military/water	Early Roman
	7. Seyala (<i>Simiou?</i>)	Military/water	2nd c. CE at least
	8. Al-Iteima/Duwi/Hammad	Military/water	2nd c. CE at least
	9. Khashm al-Menih/Zeydun (<i>Didymoi/Dios</i>)	Military	1st–4th and 5th–6th/7th (?) c. CE/Mamluk
	10. Khawr al-Gir (<i>Aphrodito</i>)	Military	1st–2nd and 5th c. CE
	11. Daghabag South	Military	Early Roman (?)
To Berenike	12. Abu Greiya (<i>Iovis/Dios</i>)	Military	1st–4th c. CE
	13. Bezah	Military	1st–2nd and 5th–6th c. CE
	14. Gerf (<i>Aristonis</i>)	Military	1st–2nd and 5th–6th/7th (?) c. CE
	15. al-Dweig (<i>Falacro?</i>)	Military	Early Roman
	16. Umm Gariya/Umm Ushra	Military	Early Roman
	17. Wadi Gemal (<i>Apollonos</i>)	Military	1st–6th/7th c. CE
	18. Abu Heilig South	Military	Early Roman, some Late Roman
	19. Siket	Military/water	1st–3rd c. CE

Roman fortlets, nine of them having access to **potable water** by means of wells found inside their walls. Interestingly, no new wells or water storage installations were furnished outside the forts in the Roman period; even more significantly, only one Roman fort on *Hodos Berenikes* (at Siket) had a well within its fortifications.

Not all roadside installations in the Quft road network were of military nature. In fact, we know of at least **four civilian road stops** by *Hodos Berenikes*.

In contrast to *Hodos Mysormitike*, only **five** sites on *Hodos Berenikes* can be classified as **quarry/prospecting nodes**, the majority of them linked to beryl and emerald mining and processing facilities north of Wadi Gemal.

Table 7.6 New trade nodes in the Quft subsystem

New trade nodes in the Quft subsystem	Type of node	Occupied in (dated through pottery/other remains)
1. Rod Legaya	Trade (road stop)	Early Roman
2. Umm Kebash	Trade (road stop)	1st–4th/5th c. CE
3. Hilan	Trade (road stop)	Early and Late Roman
4. Wadi Gemal East	Trade (road stop)	2nd–4th c. CE

Table 7.7 New resource extraction nodes in the Quft subsystem

New resource extraction nodes in the Quft subsystem	Type of node	Occupied in (dated through pottery/other remains)
1. Gebel Rokham/Atafla	Quarry	Roman–modern
2. Nugrus, Nugrus West, Abu Rushaid (Nugrus North)	Beryl/emerald mine	Early–Late Roman
3. Kab Marfu'a East (not depicted)	Beryl/emerald processing	2nd–5th c. CE
4. Kab Marfu'a/Wadi Gemal north (not depicted)	Beryl/emerald processing	2nd–5th c. CE
5. Wadi Duba' (not depicted)	Beryl/emerald mine	Late 1st c. BCE–early 1st c. CE

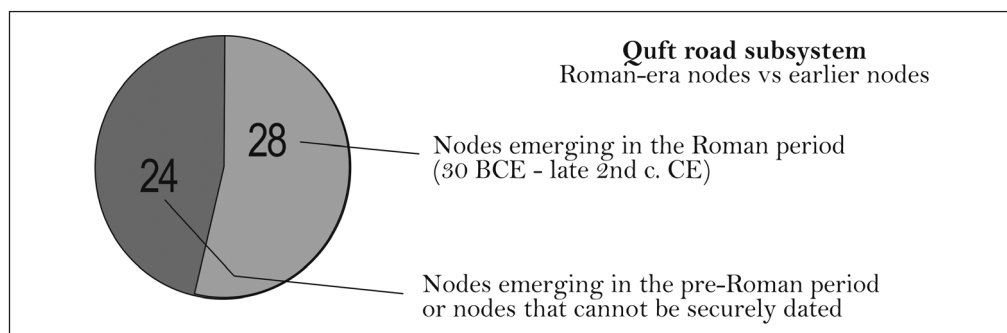


Fig. 7.7 Quft road subsystem: new nodes in the Roman period

Out of **fifty-two nodes** found in the analysed region,²² **twenty-eight nodes** appeared between 30 BCE and the late 2nd century CE, confirming the Quft road subsystem saw a significant increase in road installation density in the analysed period. Roads were travelled in the Ptolemaic period to access the Red Sea ports of Myos Hormos and Berenike; however, after the Roman conquest, road installations on Quft trails were improved and extended, with many new Roman *praesidia* built and other ones replacing previous Ptolemaic foundations. In other words, road density did not increase, but roads in the Quft sector that existed were brought to a better standard under the new desert management.

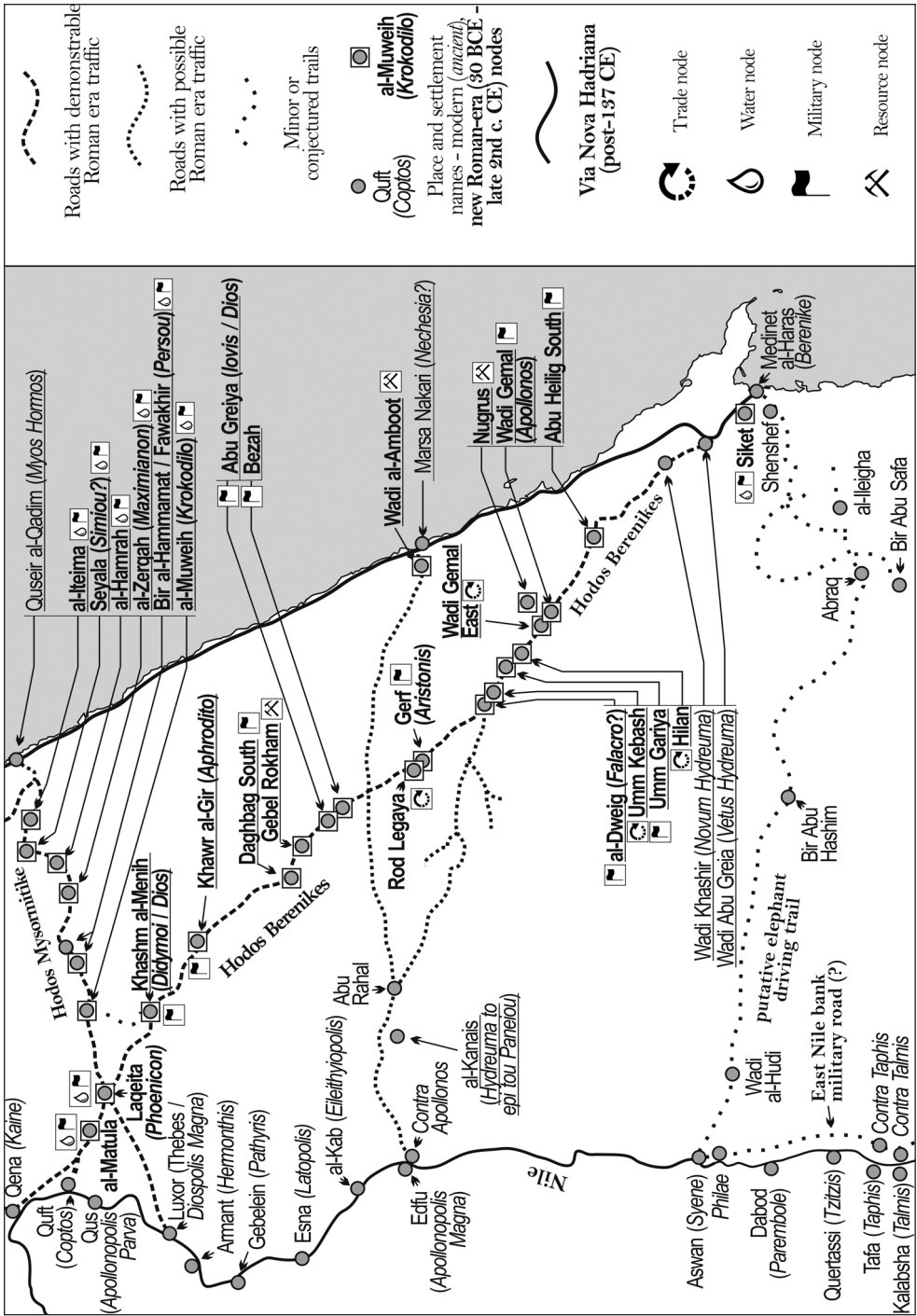


Fig. 7.8 Quft road subsystem: spatial distribution and typology of new nodes

Table 7.8 New nodes in the Edfu subsystem

New nodes in the Edfu subsystem	Type of node	Occupied in (dated through pottery/ other remains)
1. Al-Amboot	Quarry	Early Roman

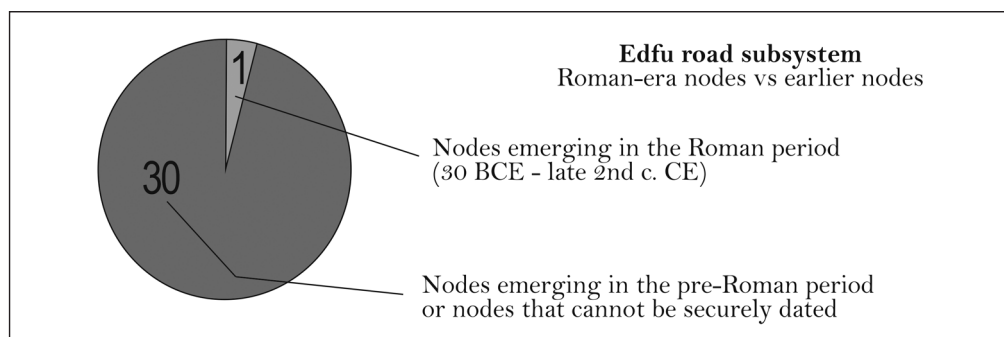


Fig. 7.9 Edfu road subsystem: new nodes in the Roman period

7.2.1.3. Edfu road subsystem

The Edfu road subsystem comprised two Ptolemaic roads that linked the Nile Valley to the Red Sea ports of Nechesia and Berenike; in the Roman period, they had lost much of their former popularity, and it is not certain whether they were regularly travelled. The trail originating at Edfu (Apollonopolis Magna) bifurcated in Abu Rahal, where a track veered east of the Edfu–Berenike road and ran ca. 240 kilometres to Marsa Nakari, the site where the ancient port of Nechesia is thought to have been located (see section 5.2.7).²³ Remains of road infrastructure and Ptolemaic gold mining installations alongside the entire Edfu–Marsa Nakari trail attest the trail was travelled during the last three centuries of first millennium BCE; conversely, it is not yet certain whether it saw much traffic in the Roman period.²⁴ Few sites have limited amounts of Early Roman material (if any), whereas Late Roman sites, though few and far between, can be dated with more certainty. Discoveries of Late Roman sites, situated along the eastern section of the road, imply that at least the eastern section of Marsa Nakari trail was travelled in the Late Roman period. It is possible that, by the 4th–5th century CE, the track's western section had been abandoned, but its coastward section was still travelled, albeit as an access road for those coming from the shore to visit inland Late Roman communities.

Another track from Edfu branched off at Abu Rahal, turned southeast, and ran towards Berenike (see section 5.2.6); from al-Dweig, the track converged with the Coptos–Berenike road.²⁵ In Ptolemaic times, at least some elephants brought by ships to Berenike were transported along this road to Edfu, where they were floated down the Nile.²⁶ The road was definitely in use in the 3rd century BCE;²⁷ however, evidence shows this particular track might have fallen into disuse, as most installations along

it were occupied in Ptolemaic or perhaps Early Roman eras but not in the subsequent period.²⁸ Significantly, the road's extensive use in the Ptolemaic era and subsequent abandonment in the Roman period bears a resemblance to the site occupation pattern at the aforementioned coterminous Edfu–Marsa Nakari track, with a distinct Ptolemaic occupation layer and only faint traces of Early Roman presence.

The Edfu road subsystem differs from its northern and central counterpart in that it includes only **one** road node added in the Roman period (30 BCE–late 2nd century CE), an Early Roman quarry in al-Amboot, on the easternmost section of the Marsa Nakari trail. In light of its chronological isolation in the Edfu system context, it can be safely presupposed that the quarry was accessed from the Via Nova Hadriana system, rather than from the remoter and less convenient Edfu track.

Out of **thirty-one nodes** found in the analysed region,²⁹ only **one node** (al-Amboot) appeared under the Romans, signalling the Edfu road subsystem experienced an unexplained serious decline after the conquest, seeing meagre amounts of traffic. Sidebotham hypothesises that wells and cisterns situated along the Berenike–Edfu crossing might have put too much strain on the local water table and eventually dried up, an unfortunate development that brought on abandonment of these stations.³⁰ However attractive, this hypothesis has not yet been confirmed by site excavations.

7.2.1.4. Eastern Desert – a model environment for studying road density changes?

When one evaluates road networks of the central and southern Eastern Desert on the continuity-vs-change curve, it becomes clear that the Roman period was a time of profound changes in road density. After the establishment of quarry settlements at Mons Porphyrites and Mons Claudianus, Roman overseers of Egypt ordered an overhaul of the road infrastructure on the roads leading to the prospecting sites. Trade, military, and water nodes appeared along the routes to provide stone transport caravaneers and quarrymen with water, food, and shelter. In contrast, installations on tracks that did not lead to quarries, such as Ptolemaic prospecting sites on the Wadi Gawasis side trail, were abandoned. A similar road administration schema appears to have been applied in the Quft and Edfu road subsystems. Installations on *Hodos Mysormitike* and *Hodos Berenikes* rapidly increase in number after the Roman conquest, whereas stations on Edfu access trails were by and large abandoned and saw only sporadic traffic after the age of Ptolemies.

Research in nodular road structures allows one to discover interesting regularities in road infrastructure and density. All road subsystems of the Eastern Desert consist of **binary coterminous trails** fanning out as they exit the Valley. As such, they link the Nile breadbasket to vulnerable desert communities that depend on the Valley for their water and provisions. Interestingly, all three subsystems cluster around three desert entry points, although any of the wadis tumbling into the Valley could have potentially constituted the entryway for transport caravans. Assuming the Nile Valley constitutes one terminal zone and the Red Sea coast another one, one should expect that the trail network between the two should resemble a tangled interzonal web without any clear terminal points; however, it is not so. The emergence of three coterminous branching

subsystems respectively terminating in Qena, Quft, and Esna uncovers the governmental administrative mindset behind it. Luxury wares and precious blocks of porphyry and granodiorite could not enter the Valley through an unspecified gateway. Roman state interest demanded they follow easily defensible and well-visible routes through the desert, where they can be efficiently overseen and guarded during their passage through the vulnerable area where the transports can be robbed. In sum, these three coterminous road subsystems were shaped by the inner logic of the desert journey that took into account the nature of the terrain and the value of the cargo. Caravans followed wadis tumbling down into the Valley as water follows them during infrequent flash floods, choosing the path of least resistance to deliver their goods. Finally, it should be noted that the Roman administrators of Egypt may have adapted the system in place under the Ptolemies or even before them. The Edfu road subsystem is remarkably similar to its northern and central counterparts and hints at the fact that desert expeditions may have preferred this specific mode of travelling since times immemorial.

Before I proceed to discuss another large road network of Roman Egypt, I must caveat my model with a reminder that certain facts about Egyptian road networks remain poorly understood. We know much about the Eastern Desert road subsystems but very little about the Western Desert, where road installations were far less elaborate than their eastern counterparts. Three discussed subsystems do not constitute an ideal model, but they offer the best glimpse we can get at the changes that road networks of the Egyptian deserts underwent after the Roman conquest. However, it can be also argued that the Eastern desert road networks were somewhat exceptional, as nowhere else in Egypt does one find such elaborate and sprawling road installation. It is often tempting to see the Eastern Desert, as compared to other areas of Egypt, as a golden standard by which judgment can be made when one analyses other desert road networks in Egypt, in areas where roadside surveys and digs yield little data and quantifying approaches are all but impossible. However, it is crucial to stress that the abundance of data coming from a very specialised road network – in this case, a network maintained to ship expensive imported wares and precious hewn stones – cannot be uncritically applied to other environments.

7.2.2. Central Marmarican Plateau – an antithesis of the Eastern Desert

Returning to Egypt's Western Desert, road courses appear to have been largely defined by distances, availability of water resources and geo-strategic positions. [...] the oases roads have been in use since the Old Kingdom at the latest, and that they were used heavily during the following historical periods. The purposes of these roads were manifold. Trade, communication, and control of the Western Desert oases can be regarded as the main driving forces to establish these roads. At the margins of the Egyptian state, the roads represent – following a term used by Darnell – the 'economic arteries' which channelled both control over and supply of the oases. In turn, commodities such as agricultural products as well as information returned to the Nile Valley as the heartland of Egyptian culture and power.³¹

The central part of the Marmarican Plateau differs from the Eastern Desert in many palpable ways. An arid, rolling coastal plain at the northwestern shores of Egypt, it gradually rises from the Mediterranean towards the hyper arid Marmarican Plateau to

the south to tumble down into Qattara Depression. Few wadis cross the undulating plain, with local caravans having to rely on road markers and memories to find their way in the desert. Untypically for Egypt, Marmarica does not depend on the Nile, encompassed into the Mediterranean trade networks. As such, it was not traditionally included as a part of Egypt, more closely resembling oasis lands of Cyrenaica and Tripolitania.

However, the most important difference between the two lands stems from their hydrologic regimes. In contrast to the Eastern Desert, Marmarican plains do not attract and store rainfall nearly as well as the mountaintops of Atbai Mountains. In response to unfavourable climatic conditions and poor calcareous soils, ancient inhabitants of Marmarica had to develop extensive water and soil harvesting systems, systems so effective that the farms irrigated by them eventually produced surplus yields. Recent surveys by the Eastern Marmarica survey team indicate water harvesting techniques might have been locally used in the New Kingdom period (1550–1070 BC), but their most widespread and sophisticated use dates to the Greco-Roman period.³² Ongoing surveys in the Marsa Matruh (Paraetionium) region demonstrate the farms situated in the coastal and pre-desert zone of Marmarica thrived under the Roman rule, their embanked fields (*kurum*) yielding copious quantities of barley, grain, figs, olives, and grapes; surplus produce was then traded with neighbouring oases, Alexandria, ancient Cairo, and Cyrene, with profits contributing to the economic growth in the Marmarica region.³³

In the hyper arid central Marmarica Plateau, water harvesting installations could not yield enough water to sustain agriculture, but they stored enough moisture to satisfy travellers crossing this inhospitable region.³⁴ Surveying the stretch of desert between Marsa Matruh and Qara Oasis, Thomas Vetter, Anna-Katharina Rieger, and Heike Möller noticed remains of several hundred cisterns dotting the Marmarica Plateau, hewn into the limestone bedrock and often abutting ancient ruins.³⁵ The cisterns could not be dated, but pottery shards found in their context were dated to a period ranging from the 6th century BCE to the 10th century CE, with most shards coming from Early and Late Roman vessels.³⁶ The abundance of Roman remains on the cistern sites demonstrates the Eastern Marmarica in the Roman period was a busy transition zone, with a crisscrossing web of trails traversing this arid plateau and linking Siwa Oasis and Qattara Depression to Catabathmus Maior, Paraetionium, and the shores of Mareotic Lake.³⁷

To investigate in detail the Marmarican road network, one has to discuss the web of trails that cross the plain and connect Siwa Oasis to the Mediterranean. Marmarican trails conform to the point-zone model, with several trails radiating northwards from Siwa to reach different locations at the coast. Unlike the road installations of the Eastern Desert, few Marmarican roadside watering sites have been surveyed, excavated or dated; however, surveys by Vetter, Rieger, and Möller have uncovered many tantalising pieces of data concerning changes of road networks in the region. Three surveyed trails linked Siwa to the Mediterranean: Masrab al-Istabl, Masrab Khalda, and an unnamed track wending its way between these two roads.

The most significant Siwan road is undoubtedly the trail linking Paraetionium (Marsa Matruh) to Siwa, today known as Masrab al-Istabl (section 6.3.2).³⁸ Many travellers on the trail noted a great number of ancient cisterns and other antiquities

dotting the landscape between Marsa Matruh and Siwa;³⁹ recent surveys by Vetter, Rieger, and Möller proved these cisterns were a part of a Roman road installations system that supplied travellers in the region with water.⁴⁰ It is by this trail where one finds Abar al-Kanayis, probably the best studied desert road site in the region. The site comprises two cisterns (surrounded with faint traces of fields) and the ruins of a spacious two-storeyed rectangular edifice built of limestone blocks and mud bricks.⁴¹ Current excavations by the Eastern Marmarica survey team demonstrated the building in question was occupied from the 3rd century CE to the 6th century CE; it burned down and collapsed at some point in the 6th century CE, to be partially restored and reoccupied for a short time in the 6th century CE, and ultimately abandoned at the end of that century.⁴² The edifice probably served as a roadhouse for ancient travellers progressing along Masrab al-Istabl,⁴³ with excavators of the site drawing interesting parallels between the Abar al-Kanayis building and Roman *hydreumata* found in the Eastern Desert. Roman road stations in the Eastern desert usually drew water from deep wells dug inside the forts, whereas Marmarican water installations gathered runoff surface water from large areas, and accordingly, they could not be confined within buildings or fortifications.⁴⁴ Such differences in structural design of desert road stations showcase Roman adaptability to varying climatic and topographic conditions in the deserts of Egypt.

At least two alternative trails paralleled Masrab al-Istabl, linking Paraetionium to Siwa Oasis. Masrab Khalda led from Siwa to Qara and turned north-east-north, passing a group of wells where Ptolemaic pottery assemblages were found (section 6.3.1). Approaching the coast, Masrab Khalda bifurcated into two trails, one leading to Marsa Matruh (Paraetionium) and another to Garawla.⁴⁵ Eastern Marmarica surveyors found another trail winding its way between Masrab Khalda and Masrab al-Istabl. This as-yet-unnamed track left Paraetionium and ran southwards by cisterns at Bir Quseir and Bir al Naga/Bir Qasir al Sirr, where surveys uncovered pottery remains from a period between the 6th century BCE and the Late Roman age; further south, the trail split into several pathways that converged with Masrab Khalda and Masrab al-Istabl.⁴⁶

Limited pottery surveys at the cistern sites uncovered certain interesting details about the road network structure in the central part of Marmarica. In contrast to Eastern Desert, the linear-nodular trails of Marmarica were based on water nodes, with cisterns constituting the basic type of nodes found in the region. More precise quantifying studies cannot be conducted due to paucity of the material, but uncovered remains at cistern sites suggested to surveyors that Masrab Khalda was travelled chiefly in the pre-Roman period, and Masrab al-Istabl gained in popularity only after the Roman conquest; in contrast, the unnamed trail between them saw a measure of traffic in both epochs.⁴⁷

7.2.3. Two areas in comparison

The preceding analysis has demonstrated that Marmarican trails differ from the Eastern Desert ones in terms of their origin and function. In contrast to the state-governed Eastern Desert trail networks, Marmarican connectedness resulted from an ancient grassroots trading system that functioned long before the Romans and continued long after they left. Marmarican water harvesting and storage technologies, first used in

the New Kingdom period, were in use during the phase of the Roman administration; therefore, it is often difficult to differentiate between various occupation phases, with pre-Roman and Roman strata seamlessly blending into a single continuum. Nonetheless, both systems demonstrate that Roman overseers of these lands were remarkably adaptable and readily adjusted to local desert conditions, improving roads as their predecessors would have done it. This willingness to adopt the path of least resistance, contrasted with elaborate installations found in the Eastern Desert, suggests that, perhaps, the Eastern Desert road network, exceptional in its scope and traffic, should not be taken as a golden standard for Roman desert road logistics until more data comes to light about other, less intensely trodden road systems.

The reader will note this section is accompanied by neither graphs nor charts comparing the number of pre-Roman nodes to Roman-era ones. The rationale is as follows: we simply know too little about the Marmarican road networks to engage in quantitative road analysis. Surveys in that region, although relatively comprehensive, did and could not date every well, pottery heap and roadside shelter, since their number goes into hundreds: conservative estimates by the Eastern Marmarica survey team suggest only about ten per cent of all relevant sites have been properly surveyed. Based on available data, we can estimate which roads were first fitted with infrastructure in the Roman period, but we cannot gauge with any certainty how many structures and stations were erected and which sites were newly settled. Accordingly, all I provide the reader with is a reference to Map 10, found in section 6.3, where major Roman-era travel corridors are marked, in hope that future works on Marmarican desert road systems will elucidate matters by making use of larger and exacter databases of roadside sites.

Notes

- 1 These concepts are discussed in detail in section 2.1.1 of this volume.
- 2 Riemer and Förster 2013, 47.
- 3 Sidebotham, Hense and Nouwens 2008, 23–24; Sidebotham 2011, 8–9.
- 4 Bagnall, Bülow-Jacobsen and Cuvigny 2001, 325–333; Sidebotham 2011, 92–99; Amer *et al.* 2012, 13–16; Bard, Fattovich and Manzo 2013, 551.
- 5 Sidebotham, Zitterkopf and Riley 1991; Cuvigny 1996a, 139–145; Maxfield 1996, 14; Van der Veen and Hamilton-Dyer 1998, 108–110; Peacock and Maxfield 2007, *passim*; Klemm and Klemm 2008, 269–280; Sidebotham 2011, 167.
- 6 Claudius Ptolemy, *Geography* 4.5; Pliny the Elder, *The Natural History* 6.168; Strabo, *Geography* 16.4.5.
- 7 Ball 1942, 82, 184–185; Meredith 1952, 105; 1953, 101–102, 101, n. 3; Zitterkopf and Sidebotham 1989, 162; Graeff 2005, 152; Cohen 2006, 340–341; Sidebotham 2011, 184.
- 8 Sidebotham 1986, 54–67, 80–83, 86–92, 94–96, 99–100, 176–177; Zitterkopf and Sidebotham 1989, 180.
- 9 Brun 2003g, 195–203.
- 10 The location of Nechesia has been debated for an exceedingly long time. Limited surveys and excavations at Mersa Nakari uncovered a quantity of Ptolemaic, Early and Late Roman material. Claudius Ptolemy, *Geography* 4.5.8; Murray 1925, 142–143; Meredith 1953, 103; Bagnall *et al.* 2006, 319–320; Sidebotham 2011, 128, 186.
- 11 Sidebotham 2011, 126–128.

- 12 Via Nova Hadriana is not factored in, as it has a mostly administrative function and as such does not depend on nodes in the way other trails do.
- 13 Sidebotham, Zitterkopf and Riley 1991; Maxfield 1996, 11–15; Maxfield 2005, 732.
- 14 Klemm and Klemm 2013, 12–16. However, some of the installations along the trail (such as Semna/Mons Ophiates) continued to function in some capacity under the Romans.
- 15 The total of sites is a compilation of data points from Tables 5.2, 5.3, and 5.4.
- 16 Claudius Ptolemy, *Geography* 4.5.8; Pliny the Elder, *The Natural History* 6.168; Strabo, *Geography* 16.4.5, 16.4.24, 16.4.45, 17.1.45; Sidebotham 2011, 184–186.
- 17 Strabo, *Geography* 17.1.45.
- 18 Maxfield 1996, 11; Sidebotham 2011, 184.
- 19 Sidebotham 2011, 128.
- 20 Sidebotham 1997, 387–388.
- 21 Pliny the Elder, *The Natural History* 27.45; Strabo, *Geography* 17.1.45; Ball 1942, 146, 158.
- 22 The total of sites is a compilation of data points from Tables 5.7 and 5.10.
- 23 The location of Nechesia has been debated for an exceedingly long time. Limited surveys and excavations at Mersa Nakari uncovered a quantity of Ptolemaic, Early and Late Roman material. Claudius Ptolemy, *Geography* 4.5.8; Murray 1925, 142–143; Meredith 1953, 103; Bagnall *et al.* 2006, 319–320; Sidebotham 2011, 128, 186.
- 24 Sidebotham 1999, 364–368, 1997, 388–390; Seeger 2001, 81, 87; Seeger and Sidebotham 2005; Bagnall *et al.* 2006, 319–320; Sidebotham 2011, 132. Preliminary Marsa Nakari finds include materials from the 1st–2nd and 4th–5th century CE. No Ptolemaic material has been yet found at the site.
- 25 Sidebotham 2011, 126–128.
- 26 Sidebotham 2011, 42.
- 27 Householder and Prakken 1945, 114–116.
- 28 Bagnall 1976, 35; Sidebotham and Zitterkopf 1995, 41, 50; Sidebotham 1997, 386–388; Sidebotham 2011, 160.
- 29 The total of sites is a compilation of data points from Tables 5.11 and 5.12.
- 30 Sidebotham 1997, 388; Sidebotham 2011, 135.
- 31 Riemer and Förster 2013, 48.
- 32 Vetter, Rieger and Nicolay 2014, 52–53.
- 33 Str. 17.1.4; Brands *et al.* 2006; Vetter 2009; Vetter, Rieger and Nicolay 2009; 2014, 50–53; Rieger and Möller 2012; Vetter, Rieger and Möller 2013, 456, 459–460.
- 34 Vetter 2009, 12–14; Vetter, Rieger and Möller 2013, 457.
- 35 Vetter, Rieger and Möller 2013, 460–470.
- 36 Vetter, Rieger and Möller 2013, 471–476.
- 37 Vetter, Rieger and Möller 2013, 476–481.
- 38 Leclant 1950, 209, n. 4; Fakhry 1973, 14; Giddy 1987, 17; Wagner 1987, 151; Kuhlmann 1998, 159; Aldumairy 2005, 2; Rieger *et al.* 2012; Kuhlmann 2013, 148; Vetter, Rieger and Möller 2013, 462–463, 469–470, 477–478.
- 39 Stanley 1912, 3–4; Rieger *et al.* 2012, 169–170. The road passes by three wells (Bir Emtiha, Bir Hilw, Bir Fuad), where members of the Eastern Marmarica survey team found pottery assemblages dated to Early and Late Roman periods
- 40 Rieger *et al.* 2012; Vetter, Rieger and Möller 2013.
- 41 Jackson 2002, 255; Rieger *et al.* 2012.
- 42 Rieger *et al.* 2012, 151–153.
- 43 Rieger *et al.* 2012, 169–170.
- 44 Rieger *et al.* 2012, 169–172.
- 45 Rieger *et al.* 2012, 137, fig. 2, 170, fig. 25; Vetter, Rieger and Möller 2013, 477–478.
- 46 Rieger *et al.* 2012, 137, fig. 2, 170, fig. 25; Vetter, Rieger and Möller 2013, 473, 477–478.
- 47 Vetter, Rieger and Möller 2013, 478–479, figs 22, 23.

Conclusions and future research

In the preceding chapters, I have compiled surviving data on desert trails of Egypt in the Roman period, discussed basic types of trail networks, and compared and contrasted two dissimilar areas of the desert that saw developments in road infrastructure in the said period. While not perfect, the development model derived from three coterminous road subsystems found in the Eastern Desert provides a passable touchstone against which other desert road networks may be measured. Admittedly, such road network studies have certain limitations. The Eastern Desert road structure was as exemplary as it was unusual, brought about by a highly specific combination of attractant nodes: ports of call for roaring Indo-Roman luxury trade and quarries yielding highly prized imperial porphyry and other valuable resources. One should not expect that other Egyptian desert road systems will straightforwardly match such structures. Another analysed area, the Marmarican Plateau under Romans, experienced a low-level of (trans-)local traffic that nevertheless bore marks of Roman interference: what linked two dissimilar desert regions is the ease with which Roman overseers of these lands adapted to local desert conditions, improving roads just as their predecessors would have done. Limitations of the model notwithstanding, it has to be stressed at this point that analysed areas may have their own special conditions to consider. For example, many Marmarican wells have not been surveyed yet; besides pottery analysis, no reliable method could securely date the cisterns to the Late, Persian, Ptolemaic, or Roman periods. Plainly said, our understanding suffers from a lack of data. Nonetheless, my study established that certain universal logistics models exist and can be applied to desert road studies to deepen our understanding of this subject.

Crucially, in this book I reconceptualised desert trails as linear corridor structures that follow expedient routes in the desert landscape, passing through at least two – or possibly more – functional nodes attracting human traffic, be them water

sources, farmlands, mines/quarries, trade hubs, military installations, or actual settlements. 'The route of least resistance' across the desert varied from period to period according to the available road infrastructure and beasts of burden employed: Roman administration in Egypt not only increased the density of local desert node networks but also facilitated internodal connections with camel caravans. Fragile desert communities can occasionally alter their environment to such a degree that an initially barren landscape can for a time support a much larger population than originally expected. Transforming the Sahara in the Antiquity – either through the establishment of new, artificial activity nodes (resource exploitation, trade, military control) or through augmentation of previous subsistence nodes (water/agriculture) – resulted in marking new desert trails or reopening of the old ones, with activity nodes acting as attractant points funnelling desert traffic into discernible corridors. Significantly, not all desert areas of Egypt are equally suited for anthropogenic development, but most have been optimised in one way or another, with road installations built for added comfort and safety of travellers. Accordingly, Roman developments in taming and navigating the desert become more and more relevant as Africa faces ongoing desertification due to global warming.

As always, certain questions must remain unanswered as I write these words. The volatile political situation in Egypt after the revolution and the rise of ISIS seriously hinder desert explorers, particularly the ones that are interested in the Western Desert. Secluded desert infrastructure is often left to looters since to venture beyond the oases requires proper permission from military authorities and involves the considerable danger of being kidnapped in the high desert.

Currently, a stream of new data on desert trails trickles from ongoing satellite imaging projects; should the political situation in Egypt improve, aerial and satellite images can be ground checked to date newly discovered nodes in desert road networks. In the central and southern part of the Eastern Desert, where archaeological surveys have been slowed down but not stopped altogether, recent surveys have brought forth a treasure trove of data, recently published in *Eastern Desert of Egypt during the Greco-Roman Period* (2018) (ed. Brun *et al.*). Beyond that region, however, many blank spots remain.

Remarkably little is known about Graeco-Roman waystations in the central-southern Sinai and the Western Desert's Limestone Plateau: satellite imaging demonstrates where desert trails went but cannot always show us roadside installations, which are best studied with land surveys and excavations. So far, very little infrastructure has surfaced in these regions; it remains to be seen whether road installations in these regions were never built (due to some peculiarity of local desert transport) or they were there all along but buried under shifting sands and invisible to cursory glances of explorers.

Other regions awaiting further attention include fringe lands between Egypt, Libya and Sudan. We know disappointingly little about the traffic between Siwa and Jakhbub Oases (section 6.10.1), Farafra Oasis and Libya (section 6.10.2), Kharga and

Selima Oases (section 6.10.3), and about desert trails south of Aswan and Berenike (section 5.3.1) and between Siwa and Farafra (section 6.9.1). The paucity of data on these travel corridors often spurs scholars to stretch the available evidence and argue these routes were active in the Antiquity whether it was so or not can only be proven, however, with hard evidence from ground checks. Rapidly developing desert road archaeology and advances in satellite imaging make me cautiously optimistic that many of these blank spots will eventually be filled. The desert is, arguably more than any other landscape, an archaeological patchwork in which a Stone Age tool may lie next to a plastic bottle: only by carefully separating layers of evidence may we uncover exactly how the Roman overseers of Egypt added to its desert transport networks.

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